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DOD COST REDUCTION AND MANAGEMENT IMPROVEMENT PROGRAM

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Defense Management Journal
(formerly Cost Reduction Journal)

Published by the Directorate for Cost Reduction and Management Improvement Policy, Office of the Assistant Secretary of Defense (Installations and Logistics).

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The Defense Management Journal is published quarterly by the Directorate for Cost Reduction and Management Improvement Policy, Office of the Assistant Secretary for Defense (Installations and Logistics), for distribution within the Department of Defense.

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EDITORIAL

THE SEVENTH INNING STRETCH

gives the fans a chance to bring their scorecards up to snuff.

The seven year tally for this logistics ball game shows some interesting batting averages—in the way Defense buys and in the way Defense manages what it owns.

Here are some random rbi's.

About the buying—

- Capital investment by 40 large and medium volume defense contractors (sample in a study) increased 30 percent per dollar of Defense sales between 1960 and 1966 (reflecting the influence of Defense policy designed to minimize government furnished facilities).
- The small business percentage of prime contract awards increased from 15.9 percent in fiscal year 1961 to 20.3 percent in fiscal year 1967.
- The circle of first-line suppliers expanded 20 percent—from about 20,000 prime contractors in fiscal year 1961 to 24,000 in fiscal year 1967.
- Competitive procurement climbed from 32.9 percent of total awards in fiscal year 1961 to 42.9 percent in fiscal year 1967.
- Cost Plus Fixed Fee contracting dropped from 38 percent of total awards in fiscal year 1961 to 10.4 percent in fiscal year 1967.
- Incentive and Firm Fixed Price contracts jumped from 31.5 percent of total awards in fiscal year 1961 to 56.3 percent in fiscal year 1967.

About the management and use—

- Productivity of the work force maintaining, repairing and operating Defense real property increased 12 percent between fiscal year 1961 and fiscal year 1967.
- Transportation cost per mile to move cargo and passengers was 5 percent less in fiscal year 1967 than in fiscal year 1961.
- The occupancy rate of space usable for actual storage increased over 6 percent between June 1961 and December 1967—to a high of 80 percent.
- Supply system inventories in June 1967 were at very nearly the same level as in June 1961—in spite of an increase of 40 percent in weapons and military equipment in use during that period.

Beneficial logistics trends—like higher batting averages—do not guarantee pennants. But they do give some idea of talent and momentum and the will to win—and, in this series, they did present enough of a factual progression to prompt Secretary of Defense Clifford to say: "The Department of Defense has achieved a remarkable and enviable record for efficient management." And the progression contained enough promise for him to add: "I expect that record to be maintained—and enhanced—in the months and years ahead."

True—the seventh inning stretch does relax the kibitzers and it does assuage the anatomical distress of bleacher seating. There is one thing, however, it does not do. It does not take the pressure off the players.

COMMENTARY

Overkill and Oversight

Cost reduction will always have its cynics.

- Instead of not buying rabbit, don't buy mink.
- Instead of not taking a bus, don't take a taxi.

Et cetera, ad nauseam.

We have heard them all. The formula is simple. Invent a phony intention, contrast it with a more costly non sequitur, concoct a desirable non-feasance, and impute the whole fraud to cost reduction.

Funny? Maybe so. But just how funny to:

- The DSA employee who saw no use for the 2½-cent-a-unit heel pads *actually* inserted in nail-less boots with one-piece molded rubber sole and heel, said so, and saved the Government $108,000.
- The Army seamstress who saw no use for the single thread *actually* encircling the salvage end of a new trouser leg to stop raveling when common sense told her that the end would be cut off anyway after the fitting (raveled or unraveled)—and by her insight saved the Government $50,000.
- The infantryman at Ft. Benning who found that a common map tack (costing a penny and a half) was just as effective in repairing a component of the 105mm Howitzer as the *actual* stainless steel pin assembly (costing $1.82)—and by his finding saved the Government over $15,000.

Deprecatory humor we can live with (and have to). But there are other, more serious drags on the Cost Reduction Program up with which (in puristic Churchillology) we should not have to put.

Here are some past peeves ruefully recalled:

- One Departmental headquarters spent more time reviewing cost reduction actions under $100,000 than it did on those $100,000 and up.
- One organization asked contractors to supplement periodic progress reports of money-saving Class II engineering changes with interim individual cost reduction action reports.
- Seven subordinate units affected by a centralized savings decision supplemented the consolidated headquarters report by filing separate individual action reports.
- Some auditors caused repetitive submissions of consolidated reports by noting one exception at a time instead of citing *all* exceptions at the time of initial rejection (one saving of a few hundred dollars penetrated the audit screen on the 7th try).
- Some field activities never knew when their Department finally accepted their savings claims because there was no feedback procedure.
- Top level personnel at some activities never received formal status reports on their own programs (because Departmental policy did not require it).
- Some organizations received excessive copies of each savings report.
- Some auditors rejected *bona fide* actions when the submitting organization could not prove the changed situation (which was generating the savings) would endure forever and a day.
- Some descriptions of low dollar savings were windy and some descriptions of million dollar savings were two sentences long.

More could be added, but enough is enough. While these particular shortcomings have been corrected, others of similar genre do crop up from time to time. The point is that nothing will cripple the spirit of a worthwhile program quicker than administrative overkill and its obverse, administrative oversight.

Cost reduction reports should be neither CPA reconciliations of bank statements nor ballpark guesstimates of economic occurrences. What they should be are *reasonably* appraised, *reasonably* supported, *reasonably* accurate reflections of the impacts of innovative management actions on Defense costs.

The directive, instruction or memo that covers every "do" and "don't" has not yet been drafted. Until it is (which we hope is *never*), only common sense can strike the happy medium.

Directive Re-Issued

Deputy Secretary of Defense Paul Nitze reissued DoD Directive 5010.6 on 21 May 1968. The most recent past version was dated 15 February 1967—and the new issuance, of course, supplants that one. The sole reason for the re-issuance was to give directive status to the already on-going Management Improvement Program.

(*Continued on page 64, COMMENTARY*)

The U.S. Supersonic Transport, which will be the world's swiftest commercial jet, in this artist's conception flies subsonically with its variable-sweep wing extended. With the wing in this position, the U.S. SST will be able to cruise at the same speed as today's large jet transports. The 300-passenger jet airliner also will cruise at speeds up to 1,800 miles an hour with the movable wing swept to a 72-degree position.

The Concept of a DEPARTMENT OF TRANSPORTATION

By ALAN S. BOYD
Secretary of Transportation

DOD AND DOT are closely related in more than just sound or letters. An efficient transportation system, always important to the social, economic and political health of a nation, is vital to national defense in time of emergency.

One of the mandates from the President and Congress when the Department of Transportation was activated last year was "to facilitate the development and improvement of coordinated transportation service, to be provided by private enterprise to the maximum extent feasible."

That sounds reasonably simple but a year later we are just beginning to understand the complex problems it entails.

As we entered the picture, more than 90 million motor vehicles streamed over 3 million miles of streets and highways. Commercial airlines flew 1 billion miles a year and, together with private aviation, crowded the airways with 100,000 aircraft. Americans each year traveled almost a thousand billion passenger-miles between cities, 89 percent by private auto. More than 1.5 trillion ton-miles of freight moved annually by rail, truck, air, pipeline, rivers, canals, and the Great Lakes.

Civil Transport Supports Military

More specifically of interest to Defense personnel is the support which the transportation system provides to the Nation's military effort. The total civil economy movements in support of the military are estimated to be at least 5 percent and as high as 15 percent of the total economic movement. As shown in Figures 1 and 2 the impact of the Vietnam war on the transportation system has been great. Neither in time of peace nor in a limited war such as we are presently engaging in could DOD support its world-wide commitments without the support of the civil transportation system.

At the time the President should declare a national emergency, transportation support would be even greater. In war time the President may direct that the Coast Guard become part of the Navy. The Federal Aviation Administration may be directed to move some, if not all, of its functions to DOD. Through our Office of Emergency Transportation, DOT would effectively assume overall control of all civil transportation and direct its use to meet the emergency. This would be accomplished through the several transportation "operating" agencies including the Interstate Commerce Commission, the Civil Aeronautics Board, the Maritime Administration of the Department of Commerce, as well as DOT's constituents, the Federal Aviation Administration , the Federal Highway Administration, Coast Guard, etc. These activities include the Civil Reserve Air Fleet Program; SCATANA for control of aircraft; controls over merchant shipping, ports, and the Nation's railroads; and by the exercise of Federal Regulations over highway traffic. Additionally, a system of priorities would be established governing the type of shipments which could be made over these various systems.

Load, Urbanization, Technology Strain System

Today, however, logistical catastrophy threatens this great system and may affect future operations. The structural parts are there but some of the nuts and bolts to hold it together don't quite fit. Under a too heavy load, disproportionately distributed, it is straining badly at some of its joints—and even the more conservative seers predict that its load will double at least every 20 years.

In addition, living patterns have changed from rural orientation with the country now moving to the city. By 1975 our present population of 200 million will rise to 230 million, with more than 75 percent concentrated in urban areas. Almost 40 percent will be located in three corridor metropolitan complexes.

This increasing urbanization creates multiple problems that require new answers. Right now traffic in New York City reportedly moves at a slower average pace than it did in the horse-and-buggy days. Air and noise pollution in several areas of our country are reaching the danger level. The mass resistance to new freeways in some cities points to the need for total planning with due consideration of environmental factors, rather than the simpler approach of planning transportation facilities and services solely to move people and goods.

The new Department was charged with responsibility for coordinating a hybrid network, where private automobiles use public highways, private aircraft fly from public airports over government-controlled airways. and private ships and barges ply public waterways. The private network grew piece-meal along with the rest of American industry, following opportunity, serving success, and going down with failure. Public policy sometimes appeared to favor the railroads, sometimes the highways, sometimes the airports. There was no interrelated long-range planning.

FIGURE 1.—*DOD Domestic Civil Transportation Movement*

Freight	Fiscal Year 1964		Fiscal Year 1967			
	Tons (Thousands)	Ton-Miles (Millions)	Tons (Thousands)	Percent of Change	Ton-Miles (Millions)	Percent of Change
Rail	7,058	4,364	10,806	+53	8,972	+106
Motor	6,579	3,248	8,915	+36	5,332	+175
Water	3,018	943	2,823	−6	1,043	+11
Air	240	255	235	0	328	+40
Pipelines	6,157	1,945	7,571	+23	2,384	+23
Passengers	Passengers (Thousands)	Passenger-Miles (Millions)	Passengers (Thousands)	Percent of Change	Passenger-Miles (Millions)	Percent of Change
Rail	561	327	550	0	344	0
Air	1759	1746	2,751	+56	2953	+69
Bus	2201	339	3,858	+75	597	+76

Source: MTMTS.

FIGURE 2—DOD U.S. Flag Shipping Calendar Year 1967

In Thousands of Measurement Tons

MSTS—Measurement Tons	CY'67 000	Percent	CY'65 000	Percent	Percent Increase 67-65
Conus to Vietnam	9,688.3	47.3	2,954.1	23.3	228.0
Conus to Other World Ports	10,802.9	52.7	9,709.6	76.7	11.2
Total	20,491.2	100.0	12,663.7	100.0	61.8

Source: MSTS.

Today, space age technology produces aircraft that carry heavier loads faster and faster . . . but the technology is not concurrently extended to improved utilization of the airways, the design of the airports, and the development of efficient connecting transport. Terminals are designed for one type of vehicle—buses, trains, airplanes—rather than as transportation centers for the convenience of the traveler. Eight-lane expressways empty their traffic into narrow city streets.

DOT Born Big

In keeping with the size of its problems and the industry it represents, DOT was born big. The Nation's twelfth Cabinet-level department was fourth largest at its inception. It brought under one administrative roof more than 30 transportation agencies or functions previously scattered throughout government; some 95,000 employees, the great majority of them in the Federal Aviation Agency and the Coast Guard; field forces operating at some 3,000 locations in the United States and in 40 foreign countries, and a combined annual budget approaching $6 billion, of which approximately $4 billion was derived from the Highway Trust Fund.

Four new Cabinet rank departments have been created in the Federal establishment in the last twenty years. The predecessors of these four departments vary widely. The Department of Defense in 1949, was created by merging the three military departments together. The Department of Health, Education, and Welfare in 1953, and the Department of Housing and Urban Development in 1965 were mostly created from former single independent agencies with the same purpose of the new departments. DOT was created from a variety of sources by merging: an independent agency, FAA; parts of other departments, such as the United States Coast Guard from the Treasury Department; and functions from other agencies, such as the safety functions from the Civil Aeronautics Board, et al.

United in their common devotion to transportation progress, these elements are widely separated in their backgrounds. To meld this far-flung and disparate organization into a coordinated operating unit; to find the best among the already established practices, policies and procedures in each agency and to explore the advisability of adapting them to the whole; to create a personnel system that will develop well-rounded experience in all modes of transport and the career opportunities that encourage individual endeavor; to develop budget, costing, ADP and other systems to serve the entire department—all represent a monumental challenge to look beyond the traditional "holding company" departments that is only gradually being met.

DOT–DOD Organizations Similar

The first job was to get the Department organized and running without interruption of the on-going programs transferred to it.

The central management concept of DOT is that the operating functions will be performed by a small number of administrations—U.S. Coast Guard, Federal Aviation Administration, Federal Highway Administration, Federal Railroad Administration, the St. Lawrence Seaway Development Corporation, and, as of July 1, 1968, the Urban Mass Transit Administration—headed by officials reporting directly to the Secretary. To coordinate the activities of these administrations oriented to a particular transportation mode, the Act provided for a Secretary, an Under Secretary, four Assistant Secretaries, and a General Counsel and an Assistant Secretary for Administration. These officials and their staffs comprise the Office of the Secretary.

In a conventional department, the assistant secretaries are in a line position over operating elements and supervise relatively large groups of "bureaus" which have similar functions or purposes but are organizationally separate. In such an organization the separate bureaus each have an administrative staff while the assistant secretary has none. The assistant secretary is frequently reduced to the role of an arbiter of the various contending needs of his bureaus and as an advocate of their programs to the head of their department. This may prevent the head of the department, the assistant secretary, and the bureau, as well, from participating effectively in managerial interaction.

In DOT on the other hand, the Office of the Secretary is expected to focus its attention, insofar as practicable, on matters of policy, program and management that require Secretarial leadership, a Department-wide perspective, or that must be pursued on an intermodal basis. Therefore, Assistant Secretaries were designated for Policy Development, Public Affairs, Research and Technology, and International Affairs and Special Programs. The responsibilities of these officers cut across all modal administration lines. The Department is, therefore, highly decentralized in the sense that the great bulk of line authority and program responsibility is exercised by the various administrators under delegations from the Secretary.

The Assistant Secretaries and the General Counsel are primarily staff officers to the Secretary rather than links in the chain of command. Each Assistant Secretary has a functional assignment under which he assists the Secretary in matters of Department-wide scope but does not exercise line control over the operating administration. This arrangement is similar to the approach taken by the Department of Defense and differs markedly from systems in which Assistant Secretaries function as supervisors or coordinators of line bureaus.

Team Approach Emphasized

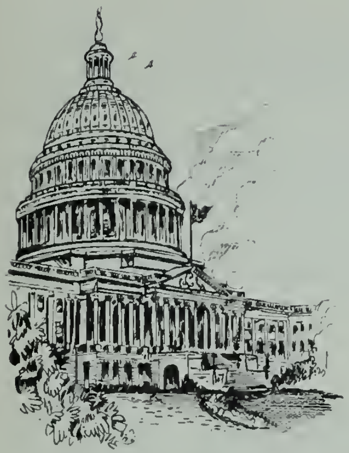
The management concept of the Department is dependent for its efficient operation on a high degree of teamwork. The various Assistant Secretaries must be alert to situations calling for coordinated action and must be sensitive to the functional interests of their associates. Teamwork is also dependent upon the direct participation of the administrators in the policy councils of the Department in contrast to a relationship in which ukases are relayed through Assistant Secretaries or other intervening Departmental officials.

This is in contrast to a concept where the top Departmental executive team does not include the heads of the constituent major elements of the Department, but is made up of only the Assistant Secretary level. Under this latter concept, the heads of the program agencies are viewed as receiving policy and program direction from the top, rather than being active participating members. The Department of Transportation organization plan intends that the heads of administrations be active participants in Departmental program and policy decisionmaking.

The team concept is emphasized by providing a formal means by which the heads of the administrations may meet regularly with designated members of the Secretary's staff, acting as key advisors to the Secretary. This is done through the Transportation Policy Council which provides an effective sounding board

(*Continued on page 40, DOT*)

Department of Transportation test train runs at speeds in excess of 130 miles per hour between Trenton and New Brunswick, N.J. The test train is a prototype of production models to be introduced on the Washington, D.C.–New York City run by the Pennsylvania Central Railroad.



"In the area of Defense management . . . there is a good deal of evidence that PPBS has not helped bring about the economies in government that it should have."

Plus and Minus in PPBS— THE PLANNING PROGRAMMING BUDGETING SYSTEM

THE SERIES of huge Federal deficits and the massive future financial burdens facing the Federal Government make it imperative that we put cost controls to work throughout the Government and do a better job in measuring the effectiveness and relative priority of Federal programs. On both counts, we have a long, long way to go.

One of the most promising developments in the direction of improved program evaluation has been the introduction of the planning-programming-budgeting system (PPBS). First introduced in the Defense Department, the President directed all agencies to begin to apply planning-programming-budgeting methods in 1965. Although many techniques of PPBS are not radically new—indeed, some government agencies have used various components of "scientific management" for well over 60 years—it has only been recently that application of these techniques has been stressed.

Progress—but Problems, too

Last fall, as Chairman of the Subcommittee on Economy in Government of the Joint Economic Committee, I conducted an informative series of hearings dealing with progress and potentials of PPBS. The Subcommittee undertook the hearings because it felt that the Congress, as well as the Executive branch, must be supplied with far better tools for evaluating the effectiveness of public programs. Based on these hearings, and on further Subcommittee research in this important area, we have gained some valuable insights into the future application of PPB techniques.

By SENATOR WILLIAM S. PROXMIRE
United States Senate

In the three years since President Johnson's directive, progress has been made by many of the executive agencies in adopting PPB techniques. Our hearings revealed gains in the following areas:

1. Agencies have been better able to see themselves in a total framework.
2. Agencies have become aware of alternative solutions to the same problem.
3. PPBS has been helpful in determining program priorities.
4. PPBS has promoted a more specific expression of program objectives.

Although the hearings showed that the Executive branch has improved decisionmaking by using PPBS, several problem areas were also identified.

1. At times, different agencies have followed differing PPB procedures, causing some confusion in multi-agency program evaluation. For example, in some agencies' benefit-cost studies, secondary benefits are counted into total benefits while other agencies tabulate only primary benefits.

2. PPBS requires good information inputs, and many times the basic data has just not been adequate. Census data relies heavily upon the 1960 Census. Agency officials stressed that none of the information needed for PPB studies has been withheld previously, but often is available only at quite high costs—in both actual money expense and in time.

3. Hopefully, over time, PPBS can bring about a better allocation of resources and funds among the various Government activities and programs. However, PPB proponents have found that many existing programs gather unique constituencies which encourage their continuance and resist program changes or innovations. In these situations, many possibilities for achieving better output are often ignored, and it becomes hard to achieve any meaningful budget reallocation. For instance, in some agencies, PPB techniques have been applied only to newer programs, while older—and generally more costly and less vulnerable—programs are left untouched.

4. In identifying priorities, agencies have had much more success in defining high priority rather than lower ranking programs. At the same time, interagency programs are complicated where a low priority project in one department may be classified on a higher rung in another department. The result: few changes in broad programs.

State and Local Pioneering

Our hearings also produced interesting testimony on the experience of State and local governments in implementing PPB techniques. At least eight States and many major cities already employ PPB systems. Five selected States, five selected counties and five selected cities are now participating in a joint program with the Ford Foundation studying application of PPBS to State and local governments.

PPB procedures have assisted State and local officials not only in improving their own decisionmaking, but also in the relationships between government branches. In my State of Wisconsin—which was the first State to extensively adopt these techniques—PPB is cited as improving the effectiveness of leadership in and between the State house and the legislature. Wisconsin officials completely reorganized the State government structure; only 26 functionally directed departments remain instead of 90 separate agencies.

State officials expressed the hope that the State governments would serve as a laboratory for PPBS experimentation and innovation which could later be applied to the Federal level. Certainly we would take a giant step toward economy in government, if we could successfully streamline the Federal Government in the manner that Wisconsin has done. Large increases in the Federal budget have clearly been related to the growing profusion of government units. I can hardly compete with C. Northcote Parkinson as a theorist, but it seems apparent that as the number of government units rises, so does the difficulty in communications between and among the various bodies, resulting in the costly duplication of efforts, in increased bureaucratic "red tape," and in a general decline in operating efficiency. PPBS has proved to be an effective means of reducing the cost of transmitting information. Hopefully we can expand the use of PPB techniques to improve program coordination and achieve reorganization along functional lines.

Improved Techniques Essential

If PPBS is going to be used extensively, we need a uniform system of PPBS standards. Different PPB methods are utilized by differing governing units, and result in significant information gaps. Findings of one body do not relate to outputs of other groups. Obviously, wide-spread application of PPB can be successful only to the extent that the techniques employed by various units are both valid and complementary.

One area in which there is room for sharp improvement is that of government discounting methods utilized in cost-benefit analyses. Present discount rates too often are set at unrealistically low levels and lead to gross misallocation of scarce resources. According to a panel of three top economists who testified in the Subcommittee's PPB hearings, the current priority need on the Federal level is a set of consistent and relevant government discount rates.

A plethora of discounting practices are now used by government. Discounting rates vary from below one percent to as high as ten percent. The alternative system to the current rage of differing rates is one of employing a set of uniform rates throughout all agencies. And rather than the low level of current rates now generally used, the case is very strong for making Government discount rates equal to the opportunity cost of utilizing funds in the private sector; that is, for an equalization of Government rates with the expected rates of return in the private sector. Whenever a divergence exists between public and private rates, transfer of funds from the private to public sector causes serious dislocations in the form of inflationary pressures and lower total economic growth.

In his proposed budget for fiscal year 1969, President Johnson has called for a revamping of low discount rate procedures employed in water resource development. This is a most welcome change in policy, and will, I believe, bring about a major budget reallocation in time. Economists claim that the low rate structure which has been used to justify many large public works projects, has produced overinvestment in water resources and reclamation. A higher rate will probably lead to

(*Continued on page 59, PPBS*)

Some Facts of Life About
COMPETITION IN DEFENSE PROCUREMENT*

MILITARY PROCUREMENT is a subject that is as old as government itself, beginning even before the founding of our nation. Specific Congressional attention to this subject started in 1792 and there were at least six different legislative actions taken during the next half century. In fact, the basic foundation for today's procurement laws and regulations dates from a statute enacted in 1860 which prescribed that all purchases should be made by advertising unless public exigencies required an exception. These exceptions were defined as the need for immediate delivery or performance, or circumstances which made competition impraticable.

The framers of the law then, as today, recognized that to assure fairness and avoid favoritism, maximum opportunity for all interested, qualified bidders should be provided. It was recognized that this procedure would require an extended period of time to accomplish. In fact, advertising was defined by law in 1842 for stationery supplies as extending over at least four weeks. It is of interest that because of its time-consuming character, the formal advertising procedure was prohibited during World War II by the War Production Board unless specifically authorized.

Following the war, the traditional approach to procurement was re-established in the Armed Services Procurement Act of 1947. This is today our basic statute, and an extremely good one. It requires the use of formal advertising as the preferred method, but provides 17 well-reasoned exceptions which have fully stood the test of the missile and space age.

Over the years, and particularly during the current decade, Defense managers have learned that, apart from assuring fairness and avoiding favoritism, wide competition can be an extremely effective technique of obtaining lower prices and better performance. This competition, as I will explain later, can be accomplished either through what the law describes as formal advertising or through competitive negotiation. During the period since 1961, a principal measure of efficiency in each of our 500 purchasing offices has been the percent of their dollars awarded under competitive methods. As a consequence of unrelenting pressure by Secretary McNamara to increase competition—pressure which Secretary Clifford recently re-emphasized in a letter to the Military Departments on May 3—there was a 30 percent improvement between 1961 and 1967 in the amount of competition obtained; and documented savings resulting therefrom have totalled over $2 billion.

By THOMAS D. MORRIS

Assistant Secretary of Defense
(Installations and Logistics)

These improvements did not just happen—they were made to happen. In fact, competition can be obtained only by the most meticulous planning. First, it might surprise many people to know that while an order can often be placed with one source in a matter of a few days, a full-fledged competition may require 5 to 6 months, or even longer, and involve 100 or more bidders. Second, on specially-developed military materiel, where the big dollars are involved, the only possible way of obtaining competition is to plan 2 or more years in advance—that is, during the development stage itself—to obtain the drawings and specifications which will enable other companies to produce the article after it has been successfully engineered. We are continuously practicing such advance planning today.

The Problem

In the light of this background of progress, which is a source of great pride to Defense officials, I believe you can appreciate our dismay in finding that some members of the Congress and the press are under the impression that we have made no progress in increasing the competitiveness of our contracting.

---

* Adapted from an address to the Chicago Chapter of The American Ordnance Association, Chicago, Illinois, May 23, 1968.

I must assume that these general indictments are based on lack of understanding of the procurement process. However, both Defense officials and contractors must accept much of the blame for such misunderstanding because we and they have simply failed to communicate, in understandable terms, the intensity and extensiveness of the competition which, in fact, exists and is fostered.

Three Facts of Life

The time has come for all of us to make another try. There are three basic "facts of life" about competition in Defense procurement which somehow must be vividly portrayed. Let me state and then illustrate each of them.

1. *The first fact of life is that the rules of formal advertising are so highly restricted by the law and its interpretations that this technique cannot be used for more than 15 to 20 percent of Defense purchases, no matter how hard we try.* Forced usage beyond this point would simply deny us the possibility of obtaining many items of adequate quality on time—and some items can never be obtained by this method—for reasons I will describe in a moment.

2. *The second fact of life is that the most widely practiced type of competitive buying which we utilize—covering almost 30 percent of our procurement—is precisely that used by the most enlightened business organizations.* We call this technique "competitive negotiation"—a term which has little meaning to the layman. A businessman would simply call it hard-nosed bargaining, aimed at getting the best product to meet his needs, when he needs it, at the lowest sound price.

3. *The third fact of life is that over half of Defense procurement dollars each year will not be based on price competition for very practical reasons.* We devote hundreds of man-years, every year, to seeking ways of obtaining multiple supply sources in such cases and have made very good progress since 1961—but no informed individual who has dealt with the problems of Defense buying over any period of time has ever dared to predict that it will be possible to reduce this so-called non-competitive fraction of our procurement below 50 percent, unless we virtually stop the development of new military hardware.

Proof

Each of the above facts-of-life can be proved with endless examples. Let me cite a few.

A. *Formal Advertising Is Highly Restricted By Law In Its Application*

This fact of life is apparently just not understood. The very words "formal advertising" are misleading, because we regularly advertise every individual purchase except, as authorized by law, those that are classified for military reasons, or where the urgency, as determined by a high-level official, is so overriding that we cannot take the extra time to be sure that all potentially interested bidders, anywhere in the United States, are informed.

So what does "formal advertising" mean beyond the act of nation-wide publication of a planned procurement? Compliance with the law requires very detailed and rigid procedural processes, which have been further interpreted and elaborated over the years by GAO. It requires that there be a specification so clear—so detailed—and so foolproof—that any prospective bidder, anywhere in the U.S., with no further interpretation by the government, can submit a responsive bid. No change can be made in that bid after it is opened by the Government. A public opening of all sealed bids is conducted at a precisely appointed hour; all bids are read aloud; and the award is automatic, based on price alone, to the lowest responsible and responsive bidder. The resulting deal is a firm fixed price contract. If any one of these requirements is missing, the procurement must be classified "negotiated": and in the minds of some this means it is not competitive.

Another limitation of the formal advertising formula is that we must accept the minimum qualifying product, and no bidder can offer us a better product even at the same price. Furthermore, where a bidder knows he has an advantage over other prospective competitors, he can bid a higher price than might be obtained if we were able to negotiate his bid after it is opened. As you can see, the prime objective of statutory formal advertising—which is to avoid any possible restriction on the opportunity to bid and win awards—does not necessarily guarantee the best buy for the Government based on both performance and price. However, from the earliest days of our nation the virtues of formal advertising have been considered overriding in the public interest. Thus, where the formula is feasible, we fully endorse this technique as the preferred method of procurement.

Last year we succeeded in placing $5.8 billion of awards using the full rules of formal advertising. As you would expect, the primary areas so covered are military construction contracts (which are based on detailed architectural drawings) and "bread and butter" items such as clothing, fuels, highly standardized parts, other commercial items, and services. But our critics are quick to point out that this represented less than 14 percent of the dollars contracted last year. This brings me to the second fact-of-life which is that, due to its greater flexibility in enabling us to procure what we need, when we need it, at the best price—

B. *Competitive Negotiation Is And Will Continue To Be Applicable To A Far Greater Share Of Defense Procurement Than Formal Advertising*

Last year $12.8 billion of Defense awards were made under this highly competitive method. This was twice the volume of formal advertising awards. But, strangely enough, some of our critics give us zero credit for this accomplishment, complaining that we are avoiding formal advertising which is the only true form of competition.

Let's examine the facts. In competitive negotiation we seek to interest a large number of qualified bidders, and to obtain the lowest price after being assured of desired quality. The principal differences between formal advertising and competitive negotiation procedures may be due to two factors: one is, that the Government and the bidders need to be able to discuss the procurement, either before or after priced proposals are submitted, in order to be certain of a full meeting of the minds as to specifications; *or*, secondly, there is some condition present which restricts the number of bidders. What our critics overlook is that these exceptions are either directed or fully endorsed by the law, and that their use requires case-by-case approval by an authorized official. Let me cite some examples:

Example: About $1.9 billion of competitively negotiated procurements last year involved set-asides for small business or labor surplus area firms. Under the Small Business Act, it is contemplated that we will reserve all or part of our procurements for small business firms, whenever there is an item susceptible to being furnished by small business at reasonable prices and there is sufficient number of qualified bidders. Also, by Executive Branch policy, we are directed to reserve part of a procurement for labor surplus area bidders whenever possible. There is no dearth of competition, I can assure you, on the typical set-aside. For example, we recently purchased 120 million sandbags for Vietnam—$27 million worth—and half of the procurement was set-aside for labor surplus firms. 165 bidders were solicited, and 24 contract awards were made. I would call this extensive competition. But the existence of the labor surplus set-aside caused this procurement to be classified as "negotiated."

Another example: Over $1.1 billion of price competition awards last year were made for subsistence, much of it the perishable variety. Perishable subsistence is bought on a seasonal basis, after visual inspection of items such as tomatoes or lettuce. Competition is thus conducted among sellers who are available in particular markets, such as Chicago, at a particular time. But because we cannot nationally advertise several weeks in advance, and have a national bid opening on a given day, these procurements do not qualify as formal advertising. This is one of the 17 exceptions written into the Act of 1947. It is a sound exception and permits us to obtain maximum competition, and, the lowest sound price, consistent with the availability of the commodity.

Another example: Last year we placed 8 million small purchase orders, aggregating $1.8 billion, where the value of each order was less than $2500; the average, in fact, was about $225. These purchases are made by hundreds of posts, camps and stations, largely from local sources, usually after obtaining quotations from three or more suppliers. The drafters of the Armed Services Procurement Act recognized that here, too, nationwide formal advertising would not make sense due to its time and cost. But the law requires that we call these "negotiated" awards—even though they are highly competitive, and conducted in accordance with practices of the best managed business firms.

A fourth example: $2.2 billion of competitively negotiated procurements last year were made under an exception in the law which permits a departure from nation-wide formal advertising when supplies or services are needed immediately for repairs to essential equipment, such as ships and aircraft, or for other time-urgent reasons. Like small purchases, these buys involve a number of bidders and have only the constraints of insufficient time to conduct a nation-wide bidding contest.

A fifth type of competitive negotiation last year was related to obtaining products from a group of companies which are essential to our mobilization base. Here $1.1 billion was placed competitively, with the largest single commodity being ammunition. Obviously, in the midst of a major war, we must maintain sources which have the facilities and the demonstrated know-how to produce a specialized military product. However, price competition is obtained whenever there are two or more eligible producers.

The above examples account for those competitive transactions in which there was a sound reason for restricting the opportunity for all possible bidders nationwide to compete. To this list can be added others such as purchases overseas for use overseas when domestic prices would be prohibitive.

The other main reason for competitive negotiation is in the development or production of specially-designed military items where considerable consultation between the Government and industry is essential. Competitive awards of this type last year totalled $2.0 billion. I recently examined in detail, one of these cases which was concerned with a $100 million contract to produce the Army's new Tactical Fire Direction System. This system will utilize computer technology in the operation of field artillery. The development of the concept started 10 years ago within the Army. By August of 1966, the Army was ready to seek an industrial source to build production hardware. A competition was conducted which extended over 15 months. At the outset, the Army dealt with 41 companies. After initial technical discussions, three of the companies were selected to compete during a funded contract definition phase. At the end of 5 months of contract definition planning, the three competitors then submitted definitive designs which aggregated 30,000 pages. The final competitive evaluation was then conducted—but extensive discussion of the submissions was essential. The winning contractor bid $107 million and the high bidder, $128 million.

To illustrate the complexity of this procurement, it took 10 years to develop the concept for this system, and one year to conduct the competition in which the contractor was selected. First deliveries will not occur until December 1971—3 years from now. The cost to the Government of conducting the one-year competition, in terms of man-hours alone, was over $350,000. Yet, some of our critics describe this transaction as noncompetitive. I am sure that any experienced purchasing executive would agree that the statutory rules of nation-wide formal advertising, which preclude consultation with the bidders, and require automatic award to the low bidder after opening sealed bids, could not possibly have been applied in this case. Yet this is typical of $2 billion of highly competitive Defense contracts awarded each year.

Finally, let me conclude by discussing the third fact-of-life about competition, which is.

C. *Over Half Of Defense Procurement Dollars Each Year Will Not Be Based On Price Competition for Very Practical Reasons*

This major segment of our procurements include POLARIS missiles, the Navy's F–4 Phantom aircraft, the NIKE anti-ballistic missile system, over $1 billion in awards to contractors operating and maintaining Government ammunition facilities, contracts for nuclear reactors, and a host of other aircraft and helicopters, including the Iroquois, the Skyhawk attack aircraft, and the Orion patrol aircraft. Clearly, future purchases of equipments such as these cannot be conducted on a price competitive basis. Thus, our problem in this area is two-fold; the first is to continue searching for a method of obtaining price competition for the parts and *components* of the specialized military goods found in this category; and the second is to devise management methods to protect the public interest in such procurements where the forces of competition cannot be relied upon to provide normal safeguards with respect to price.

We obtain some competition by "breaking out" parts and components of these major systems for competitive procurement where this can be done without endangering safety or operational effectiveness. For example, we buy the aircraft engines competitively and furnish them as Government-furnished property to the manufacturers of the aircraft. We buy many substantial components competitively, including the electrical, radar, and armament sections of the aircraft and furnish them to the aircraft producer. We do this to the extent that it is economically beneficial.

In our searches for competition on the major end items, we have occasionally been able to compete complex missile systems. The SHILLELAGH missile system is a case in point. The missile is fired from a tank and has been developed to replace existing conventional tank armament. A development contract was awarded in June 1959 after design and technical competition. During development, advanced procurement planning made it apparent that the Government would benefit by the introduction of competition from a second source. Known missile producers were contacted with 37 indicating interest. In July 1965 formal requests for quotations were issued with nine responses—five of which were considered within the zone of consideration. After review and evaluation and negotiations with all five, a selection was made and a competitive contract awarded in March 1966, for $1.5 million with options permitting the Government to buy an additional $10.1 million from the second source. This plan was aided by a "leader-follower" concept in awarding a contract to the original source to assist the second source in the areas of orientation of key personnel, consultant services, and flight test support. Today the second source is on schedule and has successfully test-fired a number of missiles. Thus, we will have two strong competitors for an item that we expect to buy in some quantity for the next several years.

Procedures Assure Lowest Cost

Where we cannot obtain competition, our procurement procedures are designed to assure us of obtaining these complex systems at the lowest possible cost. It is to this area that we assign our most highly trained personnel—negotiators, engineers, price analyists, auditors, contract administrators, quality assurance specialists, and project managers. This contracting team must evaluate the reasonableness of each element of cost in the bidder's proposal. To accomplish this, the contracting officer received an itemized breakdown of the principal cost elements: (1) direct material, (2) purchased parts, (3) subcontracted items, (4) direct engineering labor, (5) direct manufacturing labor, (6) overhead. (7) general and administrative expenses, and (8) profit. These data are then carefully analyzed by Defense auditors who examine the company's books and accounting records in order to verify the basis of the cost estimates and past trends. In addition, Defense engineering specialists evaluate the estimates of the material to be consumed, the labor hours to be expended, the tooling and production processes to be utilized, learning curves, etc. Thus, the contracting officer is well armed—before he sits down at the negotiating table—with highly detailed and evaluated cost facts.

To make this process even more disciplined, Congress in 1962 enacted Public Law 87–653, which requires each prospective contractor to certify that the cost and pricing data supporting his proposal are accurate, current, and complete, based on the facts available at that time. If this certification is later found to be erroneous, with the result that the price to the Government is higher than it would otherwise have been, we are entitled to a price adjustment.

Finally, we are constantly seeking new producers.

(Continued on page 64, COMPETITION)

Is This Any Way to Run a System?

Suggestions Without Cash Awards

THE MOTIVATION of employees to think about and contribute their ideas on how the organization can improve operations, products, and services is a major and continuing concern of managers, whether in Government or in private industry. The suggestion system, with its cash and other forms of incentive awards, has traditionally been one of the mainstays in the employer's effort to encourage greater involvement on the part of employees. While the suggestion system may be considered a "safe thing to do," employers often find it actually contributes little to the positive motivation of employees toward becoming fully contributing members of the organization. Within this context, a review of the long-standing and uniquely different TVA approach to encouraging employee involvement may be of interest.

TVA does not operate a suggestion system as such. The program which produces suggestions is a system of union-management cooperation which is much broader in scope. Any attempt to compare the TVA approach with a checklist of requirements for a traditional suggestion system would, I am sure, find us lacking. For example, TVA does not pay cash for suggestions. Yet, in 1967, the rate of adopted suggestions was 16 per 100 employees. The acceptance rate under the Federal Incentive Awards Program for the same year was 5.3 per 100 employees. Most of the suggestions received by TVA resulted in cost reductions. Where feasible, these costs have been calculated but, where costs are not readily measurable, it is not necessary to use administrative time for rationalizing the cost figure as a basis for paying cash awards. Neither is it necessary to face the dilemma of determining which suggestions qualify for cash payments and which, though useful, do not qualify.

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How does this system operate? I will attempt to answer that question as well as give some of the background and underlying concepts of the cooperative system in TVA.

Background

In 1935, two years after TVA was created, the Board of Directors issued an employee relations policy, which is still in effect. The policy specifies that TVA wishes to deal with its employees through their duly constituted representatives. As a result, today more than 11,000 blue-collar workers belong to one of 16 AFL–CIO unions, according to the employees' craft classifications. There are approximately 6,500 nonmanagement white-collar workers in TVA, including engineers and scientists. Ninety percent of them belong to unions. There are five white-collar unions. Three of them are affiliated with the AFL–CIO and two are independent.

TVA deals with its craft unions through a Council which represents all craft unions. It deals with its white-collar unions through a similar central body called a Panel. For more than 25 years agreements between TVA and the Council and TVA and the Panel have included provisions for union-management cooperation. The basic Articles of Agreement between TVA and its unions states that "both parties recognize that cooperation between unions and management is important to the accomplishment of the public purpose for which TVA has been established. Joint committees or conferences are established for the purpose of systematic union-management cooperation on matters of mutual interest."

When the Federal Incentive Awards Program was before Congress, TVA unions and management asked, and were granted, exclusion of the agency from the act. There was mutual concern that payment of cash for suggestions would encourage competitive activity contrary to the spirit and damaging to the operation of a more broadly based cooperative program, which also produced suggestions.

Objectives

The negotiated supplements to the agreements between TVA and its unions set out objectives for the cooperative programs. These objectives are: strengthening the morale of the service; improving communications between employees and management; conserving manpower, materials, and supplies; improving quality of workmanship and services; eliminating waste; promoting education and training; correcting conditions making for grievances and misunderstandings; safeguarding health; preventing hazards to life and property; improving work conditions; and encouraging good public relations.

Conferences do not act upon items which are subject to negotiation, nor do they handle grievances.

Several of these objectives, such as conserving manpower, materials, and supplies, improving quality of workmanship and services, and eliminating waste, are clearly cost-reducing objectives.

We know we can depend upon the cooperative program for continued contribution to cost-reduction efforts. For example, in 1965 when the President asked each agency head to establish cost-reduction goals and to report these goals to the Bureau of the Budget, our first report to the Director of the Bureau of the Budget included this statement:

TVA anticipates cumulative major contributions to cost reduction through the continuing efforts of its unique union-management cooperative groups, both blue collar and white collar. For more than two decades varying numbers of these organizations—at present more than 100 are in operation in TVA—have dedicated themselves to searching for ways to eliminate waste, conserve material, improve workmanship and production, promote understanding and identification, correct conditions making for misunderstandings, and similar objectives.

We also have asked help of the cooperative groups in meeting the Mission Safety-70 targets. Their contributions in this area have been and undoubtedly will continue to be significant.

These and other objectives set out above, when sought through cooperative effort, we think, also contribute to a climate which is conducive to encouraging and satisfying the inherent desire of people to do their best. This includes conscientiously working to produce at a high level and at minimum cost.

Operation

The agreements provide for the machinery to achieve the negotiated mutual objectives. The central negotiating body of the unions appoints a representative from each union to a central joint cooperative body. Management appoints an appropriate number of its members to this central body. The central group functions as a bipartisan unit and is responsible for developing basic guidelines for the organized program of union-management cooperation. It assists in the formation and approves the establishment of local conferences and provides assistance to them.

Each organizational segment of TVA—whether a division, branch, or some smaller administrative unit—is encouraged by both the CJCC (Central Joint Cooperative Conference or Committee), as well as by management and individual unions, to form local cooperative groups. The formation of a cooperative group depends upon the desire of both union members and management to establish one, and is based upon voluntary action. More than 115 cooperative groups throughout TVA.

Each union, with members at work at a location where a cooperative group exists, elects one or more representatives to the cooperative body. Management appoints its representatives. In a typical organizational unit with 100 or more employees, 15 to 18 people meet regularly to jointly consider specific actions for achieving the objectives mentioned above.

Each cooperative group has three officers: two cochairmen, one appointed by management and one elected by union representatives to the conference; a secretary, elected by all members of the group. One of the cochairmen presides at each meeting.

A week or more before the meeting the three officers meet to develop an agenda. The agenda items come from the representatives of the conference who, in turn, have drawn them from employee and management personnel who they represent. The agenda is prepared and distributed to all local conference members in advance of the meeting so members can discuss it with the people they represent. By the time the meeting convenes, everyone in the organization has had an opportunity to consider agenda content and to express opinions on it.

During the course of the meeting each agenda item is considered. Representatives are able to express views of people they represent as well as their own. Frequently, cost-reduction and other type suggestions which appear on the agenda are modified and improved through group deliberation. The decision to accept and implement suggestions rests with management. Often such decisions are reached in the meeting, but not always. Management may wish to study a particular idea

The author (center) and Jesse L. Harris (right) of the Office and Professional Employees International Union are shown receiving from Roger W. Jones of the Bureau of the Budget, a letter from President Johnson commending TVA employees and management on their cost-reduction program.

or suggestion and ramifications it might create if implemented. This is done outside the conference, often with the help of a joint investigating committee appointed by the two cochairmen.

Actions taken by the joint committee or conference are stated in minutes of the meeting. These minutes go to each committee or conference representative who then is in a position to discuss with his constituents the conference's activities, recommendations, and decisions reached in the meeting. In this way the circuit is closed. Ideas, issues, and problems for consideration originate with employees—both nonmanagement and management. They are considered by a representative body, action taken, and results fed back to the constituency. The constituents react, develop more ideas—often as a result of previous conference action—and get these ideas before the conference through their representatives. The process is cyclical and continuous.

Almost three-fourths of the suggestions submitted in 1967 were accepted. White-collar personnel turned in as many as blue-collar personnel. Not all suggestions were aimed directly at cost reduction, but all of them did have a bearing upon effective and efficient operation. Following is a category and percentage breakdown of suggestions:

Category	*Percentage*
Doing the job more efficiently	49
Improving work environment	14
Promoting safety and health	27
Improving employee qualifications	2
Improving morale	8

Examples of cost-saving suggestions are:

- A ratchet wrench modified by TVA employees was used to assemble a 500 kilovolt switch insulator in one-half the normal time. This represents a saving of $750 on each substation constructed.
- Manual clean-up work at transmission line tower construction sites was reduced by 30 percent by assigning a bulldozer, which formerly had idle time, to backtrack and dress grade around the last complete tower.
- Prefabrication of boiler components on the ground simplified welding and saved 4,000 manhours in erection of one power plant boiler.

The administrative structure for handling suggestions is simple. Time spent in disposing of them is not very great. Suggestions may come to the agenda committee, in which case they are considered by the cooperative group in one of its meetings. Some cooperative groups have appointed a three- or four-man suggestion committee composed of union-management representatives to handle suggestions. In such cases suggestions are submitted to the committee to process and to recommend for approval or to reject. If suggestions are accepted, management institutes them. When the suggestion is accepted or rejected, the committee tells the suggester of the decision and the reasons for it.

In addition to joint consultation on cost-saving, the program, through a representative system, helps to create, maintain, and improve constructive human relationships for getting our total job done.

The jointly constructed and executed program is designed to give every member of the TVA organization not only the opportunity but the desire to make his maximum contribution to achievement of the organization's goals. The program, based upon a system of representation, has built-in channels for communication. It provides opportunities for the initiation of activities from the bottom to the top of the organization, horizonally, and from the top down. It involves people in making decisions that affect them. It is in this way that everyone in an organization where there is a cooperative conference or committee can come to know and to understand the goals of the organization and can see the significance of his contribution in achieving them. At the same time he is in a position to achieve his personal goals or needs.

Approach Has Strong Support

The soundness of the TVA approach has been clearly demonstrated by the continued support from both unions and top management as well as the successful results produced in its many years of operation. In addition, the concepts underlying the TVA approach have gained further support from more recent research in the area of human relations. For example, Dr. Abraham H. Maslow, professor of psychology, Brandeis University, whose theory on motivation has been widely accepted, believes that people are motivated according to the degree they are able to satisfy personal needs. Higher level needs, he theorizes, are activated after lower level needs are satisfied. The personal needs which influence behavior in order of their demands upon the individual from lowest to highest are safety, social or membership, self-esteem, status-prestige, and self-actualization. Forces in the work situation are sure to influence the extent to which these needs are met, or alternatively, are not met. Our union-management cooperative program helps to determine forces in the work situation which are conducive to individual employee needs satisfaction or personal goals achievement. The program provides the opportunity for and requires a high level of interaction among employees and between superiors and subordinates at all levels. This helps to establish desirable social relationships. Everyone through direct participation or through representation has an opportunity to influence decisions and the nature of organizational activities. Doing so gives the individual a sense of accomplishment and of self-esteem. In addition, he receives recognition for contributions coming from fellow workers as well as bosses. Status-prestige is thus enhanced.

All in all, the program structure, operation, and results can help to free an individual to become all that he is capable of being. In the process, he is contributing significantly to his organization. The quality and volume of individual contributions fed into a joint representative system, winnowed by it, and in many instances improved, have a direct bearing upon organization effectiveness and efficiency.

Two important factors which are generally recognized as affecting effectiveness and efficiency in any organization are employee identification with the organization and a willingness for its members to accept change. Dr. Martin Patchen of the Institute for Social Research, University of Michigan, carried out some research on employee-management relations in TVA. He found that the existence of a union-management cooperative group in an organization correlated highly with employee identification with that organization. That is, where there were cooperative conferences or committees, employees felt themselves to be an integral and important part of their organization. The study also revealed a high correlation between the existence of a cooperative conference in an organization and a willingness for its members to accept change. These high correlations did not exist in organizations studied within TVA which did not have cooperative conferences or committees.

Union-Management Relations

Most often in organizations where there are unions, union-management relationships derive from two activities—collective bargaining and resolution of grievances through established procedures. Both of these activities require the respective parties to assume competitive positions and to develop adversary relationships. Thus, the total relationship between employer and union is often based on conflict. The relationships, naturally enough, carry over to the work group and man-boss, on-the-job relationships with negative impact upon productivity. Our negotiated cooperative program, which provides for an opportunity for continuous dialog in areas of mutual interest and common purpose, we think, engenders positive attitudes and trusting relationships between employees and management. These attitudes and relationships not only have a positive influence upon productivity but carry over to collective bargaining and grievance processing with beneficial effects for both the unions and management.

Conclusion

Our suggestion system is part of a larger system of union-management cooperation. It produces a high volume of valuable and useful suggestions without benefit of cash awards. It involves all employees at all levels in decision-making. This makes it possible for individuals to achieve their personal goals while contributing to organizational goals. We believe such combination is important to organizational effectiveness and efficiency. Systematic and regular employee-management attention to organization performance through joint consultative bodies helps to create a spirit and environment of mutual support that is the basis for cooperation on the job and constructive union-management relations. ☐

Profit Opportunities for Defense Contractors Through

VALUE ENGINEERING

THE DEFENSE DEPARTMENT'S increased emphasis on the use of value engineering contract clauses during the past few years has resulted in increasingly significant benefits to enterprising contractors who have energetically engaged in value engineering. Nevertheless, the subject of value engineering is not sufficiently understood. The opportunity it affords for increased earnings by Defense contractors is not generally appreciated.

We seek to encourage industry managers to participate in the Defense Department's efforts to increase savings for the Government and earnings for their companies through value engineering, while improving quality and reliability of the military hardware being produced. Sufficient evidence exists which discloses that value engineering techniques are making a major contribution to the objectives of the Defense Department by providing more effective defense of the nation at the least possible cost to its citizens.

The Discipline Defined

Value engineering is an organized, systematic effort directed at analyzing functions of defense systems and equipments for the purpose of achieving required results at the lowest total cost of effective ownership, consistent with requirements for performance, reliability, quality, and maintainability. Another way to look at value engineering, in more colloquial terms, is that it is a managed, purposeful, orderly means of simplifying the design and manufacture of products and thereby creates the opportunity for additional profit. When value engineering is put in this perspective, you can readily see what a vital contribution this management tool makes toward the company goal of improved earnings and profits.

Two Kinds of Contract Incentives

In June 1967, the contract clauses in the Armed Services Procurement Regulation were liberalized to provide increased incentives for contractors to engage in value engineering. There are two kinds of clauses:

1. The first kind provides for sharing with contractors savings which are generated from changes to contracts which result in reduced costs:

- *on the "instant" or current, contract,* contractors' shares are generally 50 percent of the savings and may reach 75 percent in cases where financial risks warrant it;
- *on future contracts,* sharing to contractors is usually 20 percent to 40 percent; and
- *on collateral savings,* which include such side benefits as more economical logistical support, contractors' shares are usually 10 percent of the amount saved.

2. The second kind of value engineering clause provides for a value engineering program to be undertaken by contractors, with government funds, and this type provides for sharing, as follows:

- *on current contracts,* up to 25 percent on fixed price contracts, and up to 10 on cost plus contracts;
- *on future contracts,* 10 percent–20 percent on fixed price and 5 percent on cost plus contracts; and
- *on collateral savings, up to 10 percent.*

Typical examples of value engineering earnings of Army contractors who participated in this profit-making program follow:

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- $67,900 was earned by one company for a suggestion that thermosetting plastic be used for closing and retaining plugs on a 90mm projectile.
- $188,000 additional profit was earned by a company which simplified the design of the 105mm projectile.
- $60,000 was another company's share for revising a packing specification to use "foamed in place" instead of a metal container.
- $273,500 was earned by an astute company on Value Engineering Change Proposals (VECP) concerning the gun housing and the outer drum structure on aircraft machine gun pods.

Profit Potential

There is real potential for additional profits for Defense contractors through participation in the Defense Department's Value Engineering Program. In fiscal year 1967, $22.5 billion of Defense contracts contained the provisions for sharing savings through value engineering—this was their "area of opportunity". Eight hundred and two VECPs were submitted and contractors shared in savings totalling $55.5 million in FY 1967, of which $38.5 million accrued to the government and the balance of $17 million was paid to contractors.

In the first half of FY 1968, Army contractors have won approval of 230 VECPs. Their additional profits resulting from ingenuity and interest amounted to $7.8 million and the portion of the savings accruing to the government on these VECPs amounted to $18.2 million.

The very large potential for extra income which value engineering has produced is evidenced by the experience of the eight most productive Defense contractors who individually earned between $400,000 and $2 million during FY 1967. Three of these contractors earned more than $1 million each. The total saving to the government generated by these eight contractors was about $21.3 million and the estimated shares of the contractors totalled $6.9 million. The companies are not concentrated in any one area of Defense industry, nor do they include only the largest Defense suppliers. Therefore, it is particularly significant that their rate of return from successful value engineering runs somewhere between three and four times the average for all Defense contractors.

To me the conclusions from these facts are both fairly simple and fairly startling. First, if these companies can do it, others can too. Secondly, at their rate of effort, there was something between $35 million and $50 million of potential value engineering profits left on the table by the rest of the Defense contracting community in FY 1967. I hope that it will not continue lying there in FY 1968 and subsequent years.

Some Other Benefits

Immediate profits are not the only benefit from value engineering. Other results include improved reliability and maintainability of products and improved producibility of the products. These, in turn, improve the competitive position of manufacturers on the commercial market. As suppliers to the Defense Department, their position is also improved through their ability to submit more competitive proposals. The advantages to the government in dealing with such contractors are clear. We cannot measure them in dollars and we do not try. The reduced prices which such companies can offer reflect the savings in costs which accrue to them from the side benefits mentioned previously. In addition, the government acquires more reliable equipment from a VE-oriented manufacturer. The possibility of the selection of such contractors for award of contracts is enhanced; and their active participation in value engineering also is considered in performance evaluation and in establishment of profit objectives.

Tapping the Potential

I am sure that all the top managers of Defense suppliers are interested in increasing the profit position of their company, How do they go about doing this? What do they need to do?

Top managers should initiate value engineering programs in connection with their Defense business, as a matter of high priority. If already existing programs are not paying off, they should be re-examined and reoriented to make them profitable. All levels of management must give this program their full support. In order to assure widespread support from subordinate managers, they should be given to understand, first, the potentials for profit available from value engineering; and second, the nature of the process which is called value engineering.

In order to make a profit, sincere effort must be invested in a positive value engineering program. Not only the managers, but everybody in the organization who has anything to do with the design and production of the products being manufactured should also be indoctrinated along this line.

The stature of value engineering in the organization must be heightened through the interest and support of its policy-makers and the participation of all those who can make a contribution to this money-making effort.

Systematic Approach Required

Our experience has shown that haphazard effort on an additional-duty basis will not accomplish the objective. What is essential for success is a full-time effort, headed up by trained value engineers. They can pick up ideas from every source in the organization and carry out the process of converting potentials into valid proposals for changes which qualify as VECPs under Defense contracts. Such staffs have paid for themselves many times over, in many companies, by giving system and purpose, management and orderliness to their value engineering effort. A recent study by the Logistics Management Institute (LMI) showed that companies were realizing a return on their value engineering investment ranging from 6-to-1 to 21-to-1, for an average better than 10-to-1; or 10 dollars of savings realized for every dollar spent on the value engineering program. The contribution of such a staff is most fruitful in an organizational atmosphere which is conducive to change. Nothing which has a potential for savings and increased profit should be sacrosanct from critical evaluation by the company's value engineering staff.

In addition, training and orientation of all affected elements of the organization have been found to be extremely helpful by some large manufacturers in establishing and continuing their programs. The positive attitude which leads to success in this work has to be created—and indoctrination in the techniques and benefits of value engineering is the best way to create such an attitude. But it is not sufficient to train people merely at the start of the program. If the indoctrination effort were to stop there, the program would soon deteriorate and fall apart. Consistent and continued direction and recognition on the part of top management will help sustain the impetus and continue the earning power of the value engineering program.

Goals Help Motivate

The unqualified endorsement and active support of management should be evidenced to the whole organization by assigning goals for achievement against which progress can be measured. With such goals, individual effort can be motivated by personal recognition and monetary rewards for individuals who initiate proposals.

The March 2nd issue of *Business Week* reports that Westinghouse Electric Company of Pittsburgh used value engineering and reduced the cost of the products analyzed by an average of 20 percent. The same issue reports that J. I. Case Company, through an employee suggestion program, last year put into effect 761 ideas for savings of $1,000 or more each.

In all, value engineering provides a way of life to the whole organization, so that everybody, at every level, is constantly alert to opportunities for its use in reducing costs at every turn. Such a way of life results when the value engineering-way of thinking becomes ingrained and habitual throughout the organization.

Current Problems

Now, what is on the other side of the picture? What are we doing in the Defense Department about value engineering? Apparently not enough, because the LMI study also brought out the following criticisms by industry of the processing of VECPs:

- Too many industry VECPs are disapproved by the DoD.
- Too many industry VECPs are in the hands of the DoD for "excessively long" times before being approved or disapproved.
- Too many industry VECPs are disapproved with no reasons or with only cryptic reasons for disapproval furnished the submitting contractors; contractors are not given an opportunity to correct defective VECPs so that they can be approved.
- "Feedback" information to industry from the DoD on the status of its VECPs is generally inadequate.

Adequate Consideration Takes Time

We are addressing ourselves to the solution of the problems LMI has surfaced. The Armed Services Procurement Regulation was amended to give Defense contracting personnel better and clearer guidance related to value engineering. The timeliness of the processing of VECPs has been of concern to us for some time. It does take us too long to evaluate and accept or reject industry proposals. In part, this problem is a result of the complexity of the subject matter of VECPs. It takes time to consider all the implications of a suggestion and to get the coordinated views of all those who have an interest in it. But this is necessary, since about one-third of all industry proposals which were rejected in the last two fiscal years were rejected because performance of the item or system would have been adversely affected by the proposed change.

> *"Value engineering is an irreversible process, like the loss of innocence. Once a person has experienced it, he is never quite the same again."*
>
> —A. CARRATT in *Management Decision*, Autumn 1967, p. 49.

Another third of the rejections in the last two fiscal years resulted from contractors' failure to furnish complete or accurate technical supporting information on cost analysis data. If contractors would bring their suggestions for value engineering changes to the attention of the contracting officer, and discuss their implications with him and his staff informally, they could be of assistance by indicating the kind of information needed for an acceptable proposal; and when the proposal arrives, they would be better prepared to process it promptly.

There have been other reasons for rejection. In a significant number of cases the proposal dealt with something which was initiated or developed by the government or with something which was not a valid value engineering proposal. In such cases, preliminary discussions with the contracting officer would have disclosed their deficiencies and would have saved

The author (foreground) examines a piece of production-line machinery at a Government-owned contractor-operated Army ammunition plant. Ordinarily, commercial operators of Government-owned plants are offered no incentive for value engineering vintage production equipment that is Government-furnished.

further effort on the part of the contractors and government people.

Feedback To Be Speeded

The natural interest in getting a VECP handled expeditiously leads understandably to a feeling, when nothing is heard about if for a time, that maybe nothing at all is being done to it. The failure in that case is our failure to inform the contractor promptly, on receipt, that the VECP is being considered and that it is expected to be evaluated and acted on in a reasonable time. To cure this, we are taking steps in the Army to inform contractors within 30 days after receipt as to when we expect to complete our evaluation and action; and periodically thereafter we will give the contractor information as to status, if the processing takes an extended period. In addition, the reasons for rejection will be clearly stated. Industry will have the opportunity to correct defective VECPs so that they can be reconsidered.

We are watching our experience under the liberalized Armed Services Procurement Regulation and intend to make such adjustments as circumstances warrant in order to keep up the incentive to industry. If experience with ASPR indicates that revision is needed, the matter should be brought to the attention of the contracting officer or, through the company's industry association, to the Value Engineering Directorate in the Office of the Assistant Secretary of Defense (I&L).

Training Is Accented

The Defense Department has intensified the training of its people not only in management of the value engineering effort in-house and by Defense contractors but also in the technical application of value engineering principles.

The Military Departments and Defense agencies have staffs of professional value engineers in every organization where there is a major procurement, production, development, and logistics support responsibility. These staffs do value engineering themselves and act as a catalyst for the value engineering activities performed by others in their organizations.

In order that managers at all levels in the Defense Department may have a better understanding of the Value Engineering Program and more effectively lend their support to it, a number of orientation seminars are being planned during the next several months.

We recognize that the current Defense Department program for industry participation in value engineering is not perfect. But we can't afford to wait for the perfect system because we would lose many opportunities for savings by the government and added earnings by Defense contractors. As I have previously mentioned, many such contractors have already been outstandingly successful in the current atmosphere and have earned considerable amounts through value engineering. Remember that we can't process change proposals unless they are submitted to us.

Brighter Prospect in Sight

A value engineering program takes a lot of effort and requires an investment of sufficient resources to be effective and successful. But making money is never an easy undertaking. The return on a company's investment in value engineering can be large enough to warrant its interest. We look forward to increased and energetic participation in the Value Engineering Program and the submission of more and better VECPs to the Defense Department. On our part, Defense contractors can be assured that we will give their proposals expeditious and sympathetic consideration. ☐

THE IMPACT OF THE C–5 ON AIRLIFT OF THE 70's

"It would hold a lot of hay."

MUCH HAS been written and said about the capabilities[1] of the C–5 Galaxy, but the above quote attributed to President Johnson at the rollout of the Galaxy at Marietta, Georgia last March certainly equates its capabilities to down-to-earth level.

Many people know what a bale of hay looks like, but very few people know that it weighs, on the average—about 50 pounds. Since the C–5 is capable of transporting more than 220,000 pounds over a distance of 3,000 miles, the C–5 certainly could hold a lot of hay—about 4,000 bales!

While it is doubtful that the Military Airlift Command will be called upon to airlift many loads of hay in the early 70's, the C–5 will be able to perform missions that almost defy description.

In a more serious vein, President Johnson talked about some of these at the rollout ceremony:

"The exciting adventure which produced this plane began just a few years ago. America was then developing its capacity to meet any danger that threatened it. One critical element was very much missing. Our country just could not move a fighting force quickly over long distances. Now, with this plane, this crucial need is met.

"The C–5A Galaxy can only be described in most extraordinary terms:

- It is the biggest aircraft in all the world. Its cargo floor alone is longer than the first flight that was made by the Wright Brothers.
- Its jet engine is twice as powerful as any that is now in existence.
- It can do three times the work of the biggest cargo plane that the United States now has. It cuts operating expenses almost in half.
- It can span the Pacific, from California to Japan, in one single jump.

"But most important of all: For the first time, our fighting men will be able to travel with their equipment to any spot on the globe where we might be forced to stand—and they will travel rapidly and efficiently.

Today it would take 88 cargo planes to move an Infantry Brigade from Hawaii to Vietnam. Their heaviest equipment would have to go by water. Now, *that entire operation that would formerly take 88 cargo planes and the equipment going by water can be handled by*

By GENERAL HOWELL M. ESTES, Jr.
Commander, Military Airlift Command

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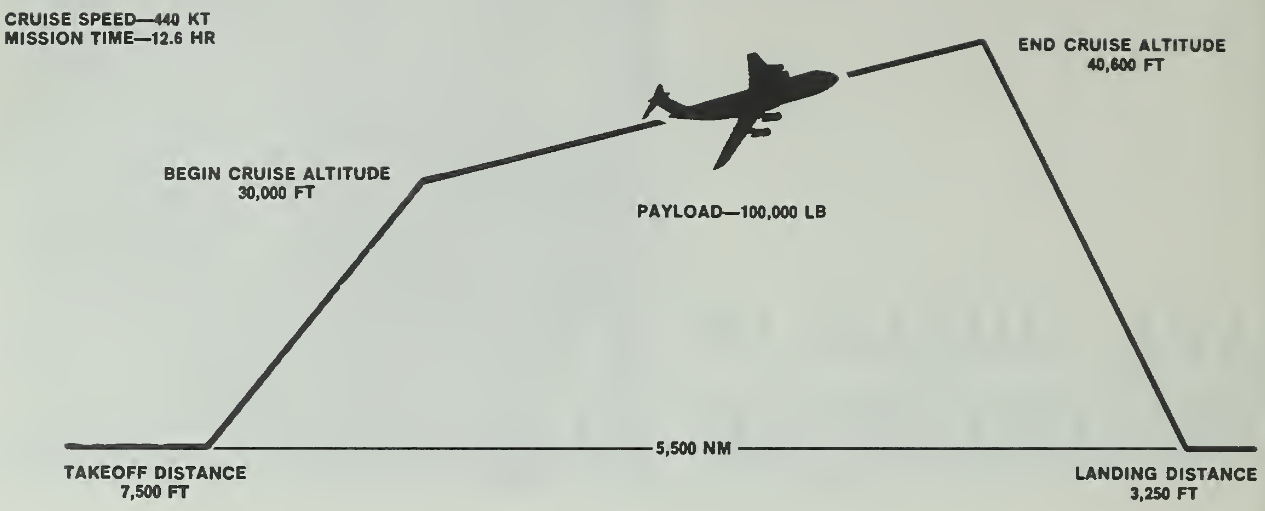
[1] April 1968 issue of Air Force and Space Digest Magazine features a series of special reports on the C–5.



BASIC MISSION PROFILE

just 20 of these new aircraft. So it is much more than a rollout of a great aircraft that you are seeing here today. We are observing a long leap forward in the effective military might of America."

1961 Requirement

Actually, the C–5 represents the fruition of a combat airlift requirement that was identified as far back as October 1961 by the Military Airlift Command. MAC realized the need for a new aircraft to replace its C–133 Force, and the need for an aircraft to support the Army's new mobility concepts.

MAC outlined some range, payload, and performance parameters which, since that time, have been re-evaluated and redefined many times by all agencies of the Department of Defense. In 1964, the C–5 requirements were finalized. Together they represented a major portion of the capability to provide the strategic combat airlift needed for the flexible response strategy of our national policy.

The primary mission of the Military Airlift Command is deployment of strategic forces in support of the national interest of the United States. During four critical months in late 1967 and early 1968, the Military Airlift Command was involved in several strategic deployment operations.

The C–5, if it had been available, could have completed these deployments faster and would have provided a greater selection of operational options. For example, in November and December, the Military Airlift Command provided 391 missions for "Operation Eagle Thrust," the airlift of the 101st Airborne Division, less one brigade, to South Vietnam. Only 115 C–5 missions would have been required to airlift the same force. In the deployment of United States Forces to Korea and Southeast Asia during January and February, the number of missions required would have been reduced by 70 percent. These are impressive statistics, and illustrate the tremendous capability the C–5 will provide.

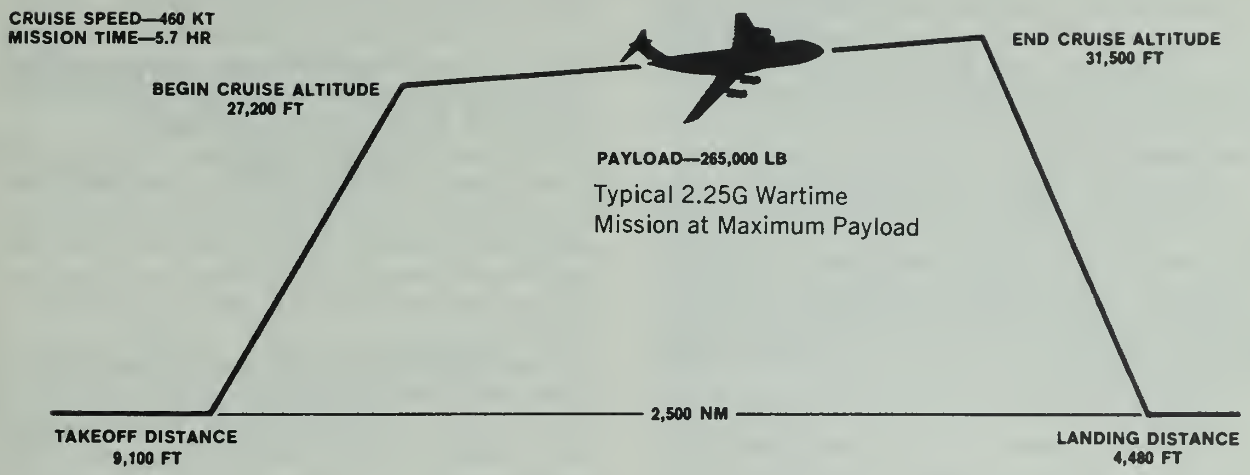
Massive Capability

The C–5, acting alone or in conjunction with the C–141 and Tactical Airlift Forces, will provide a massive airlift capability to meet multiple wartime and/or contingency requirements. The high flotation characteristics of the landing gear and its short field takeoff and landing ability will enable the C–5 to operate into short (4,000 ft), semi-prepared airstrips. It will be used to deploy combat forces directly from the Continental United States and rear area marshalling points into objective areas, using airdrop or airland techniques at semi-prepared airstrips as far forward as the situation requires.

The very large cube and lifting capacity of the C–5, coupled with the ability to transport up to 83 troops on the upper deck, will permit us to deploy a wide variety of combat forces and still maintain unit integrity which has not always been entirely possible up to now. Ninety-nine percent of all Army divisional equipment can be accommodated in the C–5 without major disassembly. Bulky items, such as a 74-ton Mobile Scissors Bridge, also can be handled by the Galaxy.

Each C–5 will be able to drop four 50,000 pound unit loads, a total of 200,000 pounds in one pass over a drop zone. This airdrop capability is extremely flexible because of the navigational package on the C–5. The C–5's multimode radar and navigational computer system provides for terrain avoidance and terrain following flight paths.

MAXIMUM PAYLOAD MISSION PROFILE



Night Airdrops

In addition, the radar has the capability to monitor 36 aircraft in the formation. These capabilities allow for airdrops in weather and at night, with the guidance subsystems positioning the aircraft at the computed air release point for a drop within 100 meters of a specified spot on a drop zone.

The capability of dropping 100 tons of Army equipment during one pass over a drop zone by one aircraft is a quantum jump forward in airdrop capability.

After initial deployment of the contingency forces, the next job for the strategic airlift forces is to resupply the deployed forces.

In this role, the C–5 will be employed primarily in the strategic airlift of supplies and equipment to multiple forward area airfields. When required, the C–5 will effect airdrop or airland delivery as far forward in the combat zone as the situation requires. Normally, however, delivery of supplies will be made to the more rearward areas of the combat zone, where the C–5 will interface with tactical airlift or other transport modes.

In those forward area airfields with little or no port facilities, air-transportable docks will be used to offload C–5 cargo. This dock can be set up in a minimum of time and handle three C–5 cargo loads at one time. Containerization and utilization of cargo, final configuration of which will depend on users requirements, will provide MAC with the methods for more rapid movement of cargo which this massive airlift system demands.

The design of the landing gear will allow landings and takeoffs at forward area airfields. Such an airfield is constructed on ground which has a minimum soil stabilization sufficient to support an Army vehicle.

A recovery base concept will be used for both deployment and resupply operations into forward areas. The use of recovery bases takes advantage of the extended range of capabilities of the C–5 and reduces facility and support requirements in the forward areas. Under this concept, the C–5 will arrive at the forward area airfields with sufficient fuel to return to rear area support airfields after offload.

Recovery Bases

Aircrew staging, refueling, supply and maintenance support will be consolidated at rear area recovery basis. Support requirements in the forward area will be limited to those which are required to make safety-of-flight emergency repairs on the aircraft and those required to receive and disperse the forces, supplies, and equipment delivered. Thus, ground times and congestion at the offload bases are substantially reduced, and vulnerability of the aircraft and crews is minimized. The use of recovery and rear area support bases also provides greater flexibility to respond to changing combat needs.

Another concept for the resupply mission will be the operation of the C–5 in conjunction with surface transportation. As an example, the C–5 may be employed in tandem with logistics ships. The C–5 and the ships under this concept would commence deployment of combat forces, supplies, and equipment at the outset of the contingency.

The C–5 would operate between the Continental United States and/or rear area marshalling points and the theater of operations until the logistics ships begin to arrive in the theater. At that time, a portion, or, if required, all of the C–5 aircraft will commence operations between the surface offload area and the objective area.

The sole peacetime mission of MAC is to prepare for the wartime mission. There are various airlift operations undertaken to prepare for this mission. These include joint airborne training exercises and special and logistics airlifts. The by-product of some of this training is productive airlift capability for movement of Department of Defense peacetime requirements.

DoD Cargo Airlift

The C–5 will, within its capabilities, provide airlift for all air-eligible DoD cargo, equipment and supplies from established, multi-directional aerial ports in the Continental United States to aerial ports in the overseas areas; between aerial ports in the overseas areas, and from overseas aerial ports to Continental United States aerial ports.

The flow of cargo between this network of strategically located bases will be as determined by the Joint Chiefs of Staff or Department of Defense users requirements. To obtain maximum effectiveness and economy from the C–5, the 83 troop/courier seats built into the upper deck will be used to airlift couriers, drivers, and troops between these bases.

The C–5 will also be used on special assignment missions to provide the capability of airlift items which are, because of dimension and/or weight, incompatible with present transport aircraft. The extended range of the C–5 and the wider range of airfields into which it can operate will permit airlift delivery of supplies and equipment into areas and airfields which have heretofore been denied the strategic airlift force. The C–5 will be employed in providing such special airlift throughout the world, as required.

In summary, the C–5, in conjunction with the C–141, and tactical airlift forces, will provide the long-sought airlift capability required for true strategic mobility. This force will provide the airlift capability for massive deployment and support of combat and support forces anywhere in the world under almost any condition.

In non-emergency conditions, the C–5 will be used in training our own airlift forces and the combat and support forces we support to insure instant and effective responsiveness to our wartime missions.

Secretary Brown's Views

Secretary of the Air Force, Dr. Harold Brown, in a speech to the Air Force Association Convention in Atlanta, Georgia on April 5th, summarized the combat role of the airlift force of the future. He said:

"For the first time, we will be able to airlift a regular Infantry Division anywhere in the world using approximately 500 C–141 flights, primarily for troops, and 270 C–5 flights to lift the equipment.

"With our programed airlift force, we could take the first brigade of such a division from mid-United States to the Far East in less than five days and the entire division in about 10 days. The move by surface transportation would require about eight troop and 12 cargo ships of average size and would take about 25 days.

"Quite obviously, these increased operational capabilities result from the large size of the C–5. What is not so obvious is the fact that we will also achieve lower operating costs. These benefits come from improvements in technology and from good management. . . .

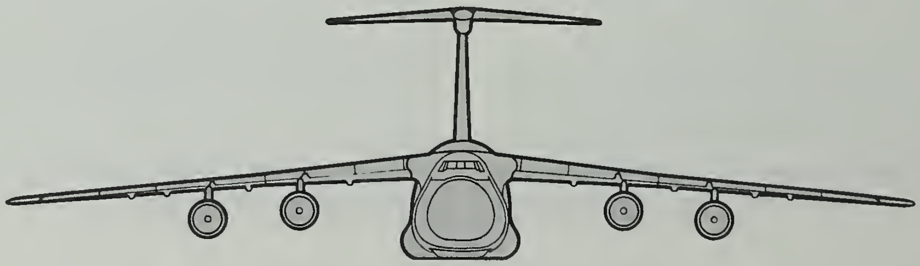
"For example, the C–5 should operate at about four cents per ton mile under optimum conditions, compared with seven and a half cents for the C–141, the current workhorse of strategic airlift.

"Another measure of economy, and a very meaningful one, is pipeline time for top priority items between the United States and overseas theaters of operations. In World War II this pipeline time was 50 to 70 days and during the Korean War top priority cargo took 24 to 57 days. Today, from the source in the U.S. to Southeast Asia, delivery time is only six to nine days. Transshipment and handling are reduced as are warehousing, breakage, pilferage and inventory control. Since these effects decrease the overall cost of transportation, we can increase the amount we can afford to airlift.

"The total cost of distribution is much more than just the ton-mile shipment cost. The fact that airlift ton-mile cost is still higher than that of surface transport does not tell the whole story. The total system's costs will often be less for airlift because of direct delivery to interior ports, lower inventory costs and—most of all—the importance of early arrival of forces on the scene—"

All of us in the Military Airlift Command are proud to be associated with this revolutionary development in air transportation. We are certain that the C–5 will provide the air logistics capability that it programmed for in the 1970's.

The combination of the C–5 Galaxy and the C–141 will provide the United States with a strategic deployment capability second to none in the world. ☐



Manning the Navy's Ships

Scientific Projections Replace Eyeball Estimates

A MANPOWER SYSTEMS APPROACH FOR:

- Mission planners
- Allowance writers
- Commanders
- Ship designers
- Personnel planners

THE NAVY has conducted successful sea trials of a new program designed to provide a more definitive determination of shipboard manning requirements, and has decided to extend the program to all ships—and to all shore stations and air squadrons as well—in the Navy.

The program, Ship Manning Document (SMD), is expected to have a major impact on such diverse but interrelated areas as manpower recruitment and distribution, new ship layout and construction, equipment design, and personnel training programs.

Replaces "Seaman's Eye" System

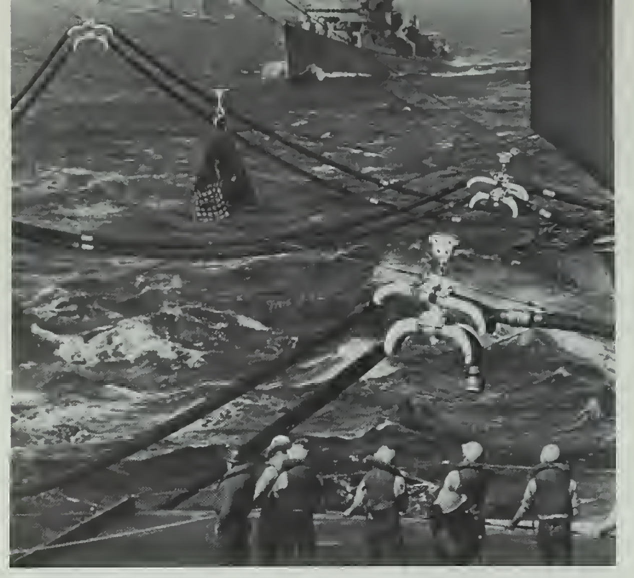
Basically SMD uses a systems analysis approach to match up the missions assigned each ship with the manpower and equipment available to carry out such missions. It spells out in meticulous detail the rationale for manning a particular ship or class of ships in accordance with assigned missions and operating capabilities.

The need for such a program had been evident for some time. Historically the Navy had used more or less of a "seaman's eye" system to determine fleet manning

By **REAR ADMIRAL D. B. BELL**

Assistant Chief of Naval Operations (Manpower)

Seamen at work over the side of USS **Norfolk DL–I,** *berthed alongside pier at the U.S. Naval Station Bermuda.*



***The attack aircraft carrier USS* Ranger *(CVA 61) simultaneously receives fuel and supplies from USS* Sacramento *while guided missile destroyer USS* Strauss *moves into position to receive replenishment from opposite side of* Sacramento.**

requirements. The experienced judgment of senior Navy officials often was the key factor in determining how many men, and of what rates and ratings, were to be assigned each ship.

And this approach, however unscientific, worked quite well for the most part, thanks largely to the excellent judgment of those officials, and to the can-do efforts of the officers and men of the fleet, who would do the job whether undermanned, overmanned (this was rare), or at exactly the correct strength for the missions assigned (this was even more rare).

But this system had a number of drawbacks, particularly in new ship construction where predictive capability was somewhat limited. A new ship was considered to require "about" as many officers and men as were assigned to older ships of the same type already in the fleet, with *ad hoc* interpolations made for ships of different sizes, or of new designs, or with new equipment systems installed.

As budgets grew tighter, ships and equipment more complex, and manpower more scarce, however, the Navy was hard pressed to justify this system before various reviewing levels of DoD and the Congress. It became necessary, and properly so, to validate all manpower requests with the facts and figures which would provide proof, rather than estimates, of the number of men required. And out of this need for proof grew the SMD program.

Less Than 5 Percent Error Asked

The evolution of the SMD concept began with the issuance of General Operational Requirement Number 43, in which the Chief of Naval Operations established the specific goal of improving measurement and predictive capabilities to the point where the Navy's manpower requirements could be determined with an error of less than 5 percent. To accomplish this goal the Staffing Criteria Research Project was initiated in 1962 to determine the most economical and accurate methods of validating Navy manpower requirements. Responsibility for the project was assigned to the Navy's Personnel Research Laboratory, a Washington, D.C. field activity of the Bureau of Naval Personnel.

The PRL people began their task by conducting studies, on-site and in-depth, on four ships to determine empirically how large a workload actually was assigned each ship and, from this, how many men were required to accomplish the workload.

Utilizing accepted work study and validation methods commonly used in private industry, a ship's workload was broken down into functional and subfunctional areas. At each subfunction level a workload indicator or unit of work was selected as a measure to represent the aggregate of related work performed.

Once the standards were defined, the task became a process of observation, recording, and analysis. Each task and each small part of each task performed in the ship was studied in minute detail, measured, and otherwise quantified. Enough observations were made to validate the accumulated data within—and usually within much less than—the 5 percent error margin permitted.

Matching Manning to Workload

For the first time the Navy *knew*, and was able to prove, how large a workload was assigned a particular ship, and how many men were required to perform that workload. From here it was a simple step to the development of staffing criteria, which are essentially management standards defining relationships of manpower requirements with the work to be performed. These staffing criteria, generally applicable to all ships, were then used to develop Staffing Tables, which tailor the staffing criteria, to the measured volume of work within any functional or subfunctional area on a particular ship.

By 1966 the research project had progressed to the point where staffing tables had been developed covering all work functions and subfunctions performed on a total of 168 ships. These were promulgated in the U.S. NAVY STAFFING CRITERIA MANUAL FOR ACTIVITIES AFLOAT, with similar tables—covering 35 functions and 240 subfunctions—published in the companion volumes for ACTIVITIES ASHORE. In accordance with CNO guidelines, the tables for shore activities were based on a 40-hour workweek, while the tables for activities performed aboard combat ships were based on 56 hours of work per week per man if he were not a watchstander while at sea, and 70 hours per week per man if he were a watchstander. There are two reasons for such long workweeks at sea which may not be readily apparent to those who have not lived at sea for weeks or months at a time:

(1) The physical space available in a warship for living accommodations is limited. The fewer men, the fewer cubic feet that must be devoted to cooking and eating spaces, laundry and washing facilities, berthing, storage space for food and clothing and the less fuel that must be burned to make fresh water, and consequently the more space within a ship that can be devoted to carrying weapons and fuel for fighting the ship successfully.

(2) Through years of experience the Navy knows that if a man is busy with useful work, the quicker the time at sea will seem to pass, and the men will be happier and the ship's spirit will be better if the men are kept reasonably busy.

Dividing up the Workload

But now, to go back to the development of manning documents—the next step was a full scale review of the entire research project to evaluate the results accomplished in light of the original mission. Did the staffing tables provide the Navy the documentation it needed to justify its manpower requests? Were the tables easily understood? Was their format adequate, or could improvement be made?

Some problem areas were discovered. Although the workload within each functional and subfunctional area was known, and from this the ship's total workload and work force required could be computed, it was impossible to tell from this information just who did what, i.e., how the workload was distributed among the personnel assigned. But this information is extremely important from a utilization aspect. Without it there is no way to determine minimum—absolute minimum—skill levels required, nor to know what parts of a particular functional workload may be shifted from one part of the work force to another, or whether and/or how much the skill level of the work force could be reduced without seriously impairing the ship's operational capabilities.

So it was decided, using the staffing tables as a takeoff position, to go a step further and fully define not only the functional workload of each ship, but the particular portion of each functional task assigned each man on the ship. This information, when complete, would be published in a Ship Manning Document tailor-made for each class of ship, with additions or deletions as necessary to reflect individual differences between different ships within the same class.

Detailed Breakouts Required

As the first step in the development of a SMD for a specific ship, it was evident, the factors that govern the manpower requirements for that ship would have to be set forth in explicit detail.

The factors common to all ships were found to be as follows:

- The ship's *mission*—each ship is built for a particular purpose or mission, the accomplishment of which calls for the completion of a number of functional tasks. These tasks usually, if not always, comprise the largest part of a ship's normal workload. In a combat ship the ship's mission normally is stated in terms of Battle Manning conditions, which for SMD purposes have been defined as follows:

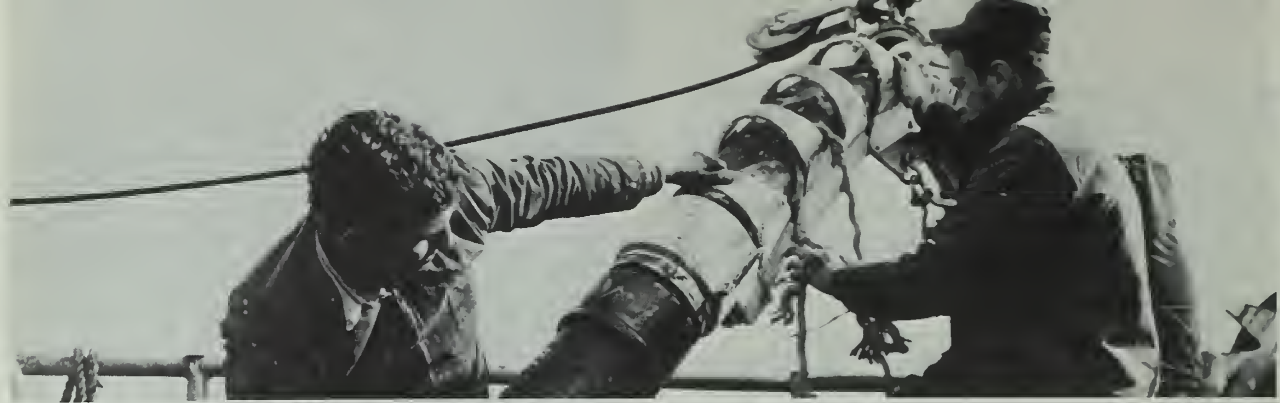
  CONDITION I. No maintenance expected except that routinely associated with watchstanding (e.g. changing lube oil strainers) and urgent repairs. All operational systems manned and operating. Maximum expected endurance 24 continuous hours.

  CONDITION II. Accomplishment of most routine underway preventive maintenance and repairs, and necessary administrative work expected. Four to six hours of rest expected per man per day. All required operational systems manned and operating. Maximum expected endurance 10 continuous days.

  CONDITION III. Normal underway maintenance and administration expected. Eight hours of rest expected per man per day. Subject to these conditions, all required operational systems manned and operating for the tactical situation expected. Maximum expected endurance 60 continuous days.

In addition to these basic conditions, of course, various subconditions are possible, depending on the alternative combinations of functions to be performed at any one time. Also—and this is a most important point—a limited reduction from Battle Manning, called Conditional Manning, may be prescribed for a ship predicated upon reduction or deletion by the CNO of one or more specific functions normally assigned the ship.

- The ship's *size*, *configuration*, and *installed equipments*—a larger ship generates more "housework" requirements (painting, cleaning, sweeping, etc.) than a smaller ship. An efficient layout of spaces saves manpower, and inefficient layout wastes it. More equipment usually means more maintenance personnel required, but some equipment automates work and thereby reduces the total work force needed.
- *Maintenance*—all equipment, machinery, weapons, spaces, etc., require some type of maintenance. *Preventive* maintenance is employed to prevent machinery breakdowns from occurring, and *Corrective* maintenance is employed to restore machinery to operational status when breakdowns do occur. In addition, for SMD accounting purposes, a ship's housework functions are categorized as *Facility* maintenance.
- *Administrative/support* manning—for any given number of personnel assigned to a ship for mission and/or maintenance requirements, additional personnel are required for administrative, clerical, supply, hygienic food service and other such functions.



Readying the rigs—Deck hands heave hard on a seven-inch hose which will soon carry thousands of gallons of black oil to a ship of the line. Navymen of the seventh fleet veteran oiler USS Mattaponi *(AO–41) spend time between underway replenishments at sea keeping the miles of rigging and fuel lines ship shape for around the clock service of Vietnam.*

- *Utility tasks and evolutions*—these are various work actions not regularly repetitive, of regular duration or of regular degree of effort, but which are required on an irregular basis required by the missions and functions of the ship. These work actions are not susceptible to expression in the form of basic manning criteria, and must be determined for each class of ship through work sampling techniques.

Allowance for Unproductive Time

In addition to the workload represented by the combination of the above factors, the computation of the ship's total workload must take into account a necessary *Productive Allowance Factor*, and a *Service Diversion Allowance.* The Productive Allowance Factor represents delays resultant from unavoidable work interruptions, fatigue, and environmental and performance factors that deduct from available productive worktime. In SMD computations a conservative 20 percent factor is used. Service Diversion activities are those necessary personnel-related actions which also deduct from total available worktime—sick call, business at personnel office, paydays, formal training of individuals, etc. SMD uses a Service Diversion allowance, developed on the basis of work sampling, of 6.6 hours weekly.

Pilot Study on Destroyers

With all manpower requirements factors thus defined, a decision was made to conduct an SMD pilot study on the DD–710 Class of Destroyers. The Navy operates 77 destroyers in this class and staffing criteria for the class already had been developed and published. In addition, the relatively new Maintenance Material Management (3M) System—which plays an important role in the SMD program—was being used in the 710 class. (The 3M System initially postulated a tentative ratio of 1 hour corrective maintenance for every 4 hours of preventive maintenance accomplished on any piece of equipment. This ratio already has been revised and doubtless will be revised further as feedback from the system dictates. The eventual goal is a validated corrective/preventive maintenance ratio for each piece of equipment installed on each ship.)

A scenario was set for the pilot study, and the objective set to determine manning requirements—using an average 74 hours watchstander workweek (66 hours for non-watchstanders)—under the following conditions:

A). At sea in wartime or contingency environment.

B). All offensive and defensive functions capable of being performed simultaneously.

C). Other functions not required to be performed simultaneously.

D). Continuous Readiness Condition III—Three Section Watch Basis.

E). All maintenance assigned to ship responsibility capable of being accomplished.

F). During in-port periods, all requirements, including maintenance, leave, TAD, training, etc., satisfied with a four section watch.

Under these conditions, all the bits and pieces finally were put together in one package. It was determined to a man how many personnel, and of what rates and ratings, were required to man the ship at Battle Condition I, at Condition III, and for each of the ship's evolutions (Special Sea Detail, Replenishment at Sea, Helicopter Detail, etc.). An inventory of installed equipments was made, and the corrective and preventive maintenance workload computed therefrom, again with the specific skill level stipulated which was considered necessary to conduct such maintenance. Once the mission and maintenance manning requirements were determined, the administrative and support requirements were computed, and finally the Production Allowance and Service Diversion factors were cranked into the formula.

Shows Functions Man-by-Man

The ship's total workload once again emerged as the end product of this combination of factors, but this time in a more comprehensible and much more flexible format than previously had been possible under

(*Continued on page 52, MANNING*)

"GOALS OR GOADS" FOR COST REDUCTION?

Motivation from the Audit Angle

A CPA Challenges Some Goal-Setting Concepts

THE DEPARTMENT of Defense Cost Reduction Program was initiated in the fall of 1962 to provide a common framework for planning, achieving, and reporting actions which result in a "better job at less cost." The Program is based on the certainty that cost reduction opportunities exist at all levels, and is intended to encourage every individual to take advantage of these opportunities.

How Goals are Set

The Cost Reduction Program provides a number of categories or areas in which to report accomplishments. Within the Navy, overall annual goals are established at Departmental level in each of these cost reduction areas. These goals in turn are portioned out through channels to each Navy activity. The procedure of assigning goals at all levels of management is, at present, the principal means provided in the Cost Reduction Program to motivate individuals throughout the Navy to maintain and improve the effectiveness of the Program. It is doubtful, however, whether goals, which are at present relied on so extensively, will provide the continuing stimulus and incentive needed to produce meaningful management actions and to impart a dynamic quality to the Program. Nevertheless, goals are one of the most important tools available to Program managers to carry out the Program effectively. This article will discuss the use of goals in the Program, and will suggest some management innovations that may tend to improve participation in and effectiveness of the Program.

As in any program, managers of the Cost Reduction Program are faced with the choice of using the "hard sell" or "soft sell" approach to attain the goals. In general, it is agreed that some pressure must be exerted to achieve significant cost reductions. There appears to be no hard or fast rule, however, to show when one "selling" method is more desirable than the other. Whether to use one or the other depends to some extent on the personnel involved and the type of motivation existing at various management and operating levels. It is likely that at any level the degree of "hard sell" approach needed is inversely proportional to the quality of leadership. The use of "hard sell" may also depend on the progress that has been made toward goals. However, under any given set of circumstances, proper motivation, both at the environmental and individual levels will do much to lessen the requirement for the "goad" or hard-sell pressure.

Purpose is Motivation

A goal is broadly defined as a purpose or end to be achieved, and also as a target. Each of us has our own personal goals which we strive to attain. In industry the principal goal is usually to increase profit, which can be achieved effectively by reducing costs. In the Cost Reduction Program goals are the annual monetary savings expected to be achieved as a result of actions reported in the Program. The success or failure in reaching these goals is the measure of participation in and effectiveness of the Program. Goals, however, are only targets which cannot be achieved unless the proper motivation exists to assure achievement. Success or failure in reaching goals depends, then, on success or failure in creating the proper environmental incentive to direct management interest into selected reporting areas. When goals are used properly they provide a means of measuring management support of the Program at each reporting level.

By **THOMAS D. COUGHLIN**
Director, Cost Reduction Division
Naval Audit Service, Washington, D.C.

Hence, the main purpose of goals in the Cost Reduction Program is to motivate management to direct its efforts toward accomplishing the objectives of the Program.

Realism Essential

Goals must be attainable, but attainable only by expenditure of real effort. To establish such goals, there must be proper planning and coordination. Management should set goals that stimulate or motivate individuals into achieving these goals. Goals, therefore, must be both realistic and attainable, and should be set neither too high nor too low. Goals that are too high may create frustration. Goals set too low may retard achievement because participation of every individual would not be required.

To encourage participation of employees at all working levels in achieving goals it is axiomatic that they cooperate in the development of the goals. This also applies to all levels of management. The greater the cooperation in establishing goals the better are the chances of establishing realistic, attainable goals. To assure proper coordination, management should provide specific guidance and criteria for developing and establishing goals.

Achievement Requires Right Climate

Establishing realistic, attainable goals is most important. Attaining these goals and achieving the objectives of the Program are even more important. An essential part of the Program, therefore, is "motivating" participants in the Program to strive to reach these goals. Motivation is a term of wide usage. In social science it is used to describe the act of providing a certain stimulus to produce a certain response. In everyday language, to motivate means to provide with an incentive, reason or inducement. Too often, proven motivation techniques are used only as a last resort when the success of a program or operation is in serious danger.

Motivation techniques should be used in a manner to assure continuous and effective participation in the Program. The use of these techniques should be an everyday way of life rather than a means of meeting a deadline. Proper motivation will assure continuous steady progress toward goals. The rate of progress toward attainment of goals will then become further motivation for complete realization of the objectives of the Program.

In providing the motivation needed to attain goals, managers must create a favorable climate or environment. The first step has already been discussed and consists of establishing goals that are reasonable but challenging. These goals must, of course, be explained to and understood by everyone involved in the Program. Provisions should also be made for adjusting the goals when necessary because of unforeseen circumstances. Procedures should be set up to keep individuals informed of the progress being made toward achievement of goals both by the organization as a whole and each unit within the organization.

In addition to proper environment, it is necessary to provide the proper motivation for each individual in order to assure successful attainment of goals. The success of any program such as the Cost Reduction Program depends largely upon the willingness of all employees to perform their duties in a manner considerably above the level of acceptable performance. In the Cost Reduction Program specifically, it depends upon the extent to which individuals are successful in finding better and less costly ways of conducting operations.

However, if individuals are expected to exert that additional effort and be constantly alert for improvements and innovations, they must be properly motivated. There should be frequent program promotion and publicity, constant reminders of the purpose of the Program, and periodic information concerning progress toward goals. There must also be a desire for job achievement. In addition, specific recognition and awards should be given for exceptional achievements. Some of these techniques are discussed more fully in the paragraphs which follow.

Publicity Helps

Frequent and lively publicity can do much to motivate individuals into an active interest in the Cost Reduction Program. It can be used to give appropriate recognition to deserving individuals for their cost-cutting contributions and produce a lasting pride in being associated with the Program.

Published pictures and stories of cost reduction achievements by individuals can increase Program interest. Newspapers, Government publications, radio, and television are excellent media for publicizing the Program and its achievements. Publicity as a motivating factor can and should be used extensively in the Cost Reduction Program.

Job Satisfaction Important

There is no better motivation than producing a feeling of job satisfaction, a feeling of pride in and dedication to the job, a desire for growth and advancement, a desire for important work responsibilities, and a desire for realization of one's highest potential. This kind of motivation does not just happen. It must be planned so that everyone in the organization benefits from it and thus is better able to contribute his part to the realization of cost reduction objectives. The top man in an organization has the primary responsibility for execution of the Program and must assure him-

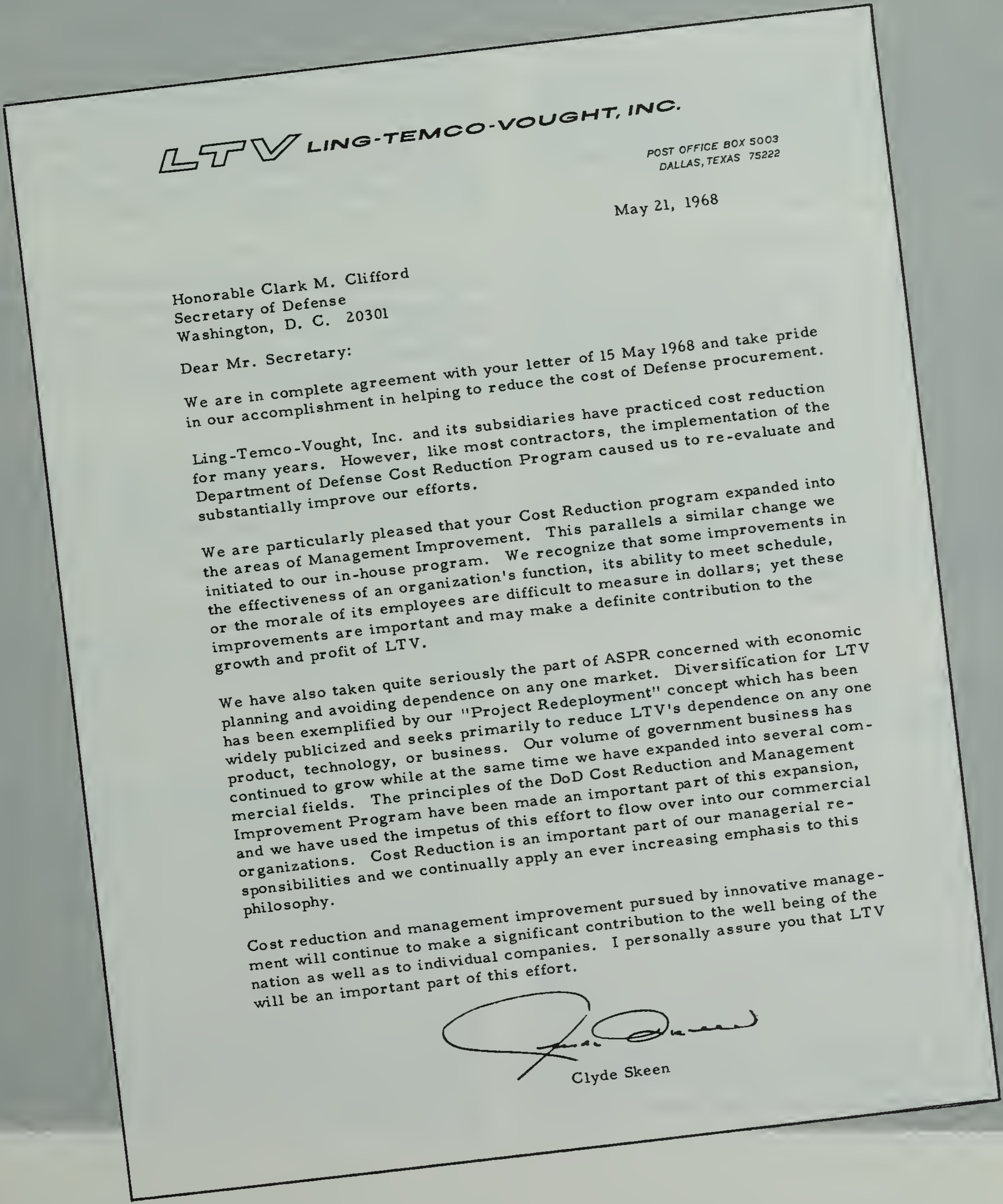
(*Continued on page 60, AUDIT*)

DEFENSE CONTRACTORS REPLY

Three months ago Secretary of Defense Clark Clifford reviewed the 3-year old Department of Defense Contractor Cost Reduction Program. He noted that the ingenuity of Defense industry participating in that program had saved the Department of Defense an average of almost a billion dollars a year for each year of the program's operation. In a special message to the participating companies he commented on these savings, saying:

"I am hopeful that you look upon this average as I do—as a base from which to generate an even greater momentum for future savings. The magnitude of the Defense budget certainly offers the potential; the current fiscal needs of the nation, the incentive. Now—as much as at any time in the past—there is a critical need to exert the utmost effort toward acquiring Defense materials at the lowest possible cost."

Excerpts from some of the contractors' replies appear on the following two pages. The Ling-Temco-Vought response is reprinted below in full as exemplifying the tenor of all of the replies.



LTV LING-TEMCO-VOUGHT, INC.
POST OFFICE BOX 5003
DALLAS, TEXAS 75222

May 21, 1968

Honorable Clark M. Clifford
Secretary of Defense
Washington, D. C. 20301

Dear Mr. Secretary:

We are in complete agreement with your letter of 15 May 1968 and take pride in our accomplishment in helping to reduce the cost of Defense procurement.

Ling-Temco-Vought, Inc. and its subsidiaries have practiced cost reduction for many years. However, like most contractors, the implementation of the Department of Defense Cost Reduction Program caused us to re-evaluate and substantially improve our efforts.

We are particularly pleased that your Cost Reduction program expanded into the areas of Management Improvement. This parallels a similar change we initiated to our in-house program. We recognize that some improvements in the effectiveness of an organization's function, its ability to meet schedule, or the morale of its employees are difficult to measure in dollars; yet these improvements are important and may make a definite contribution to the growth and profit of LTV.

We have also taken quite seriously the part of ASPR concerned with economic planning and avoiding dependence on any one market. Diversification for LTV has been exemplified by our "Project Redeployment" concept which has been widely publicized and seeks primarily to reduce LTV's dependence on any one product, technology, or business. Our volume of government business has continued to grow while at the same time we have expanded into several commercial fields. The principles of the DoD Cost Reduction and Management Improvement Program have been made an important part of this expansion, and we have used the impetus of this effort to flow over into our commercial organizations. Cost Reduction is an important part of our managerial responsibilities and we continually apply an ever increasing emphasis to this philosophy.

Cost reduction and management improvement pursued by innovative management will continue to make a significant contribution to the well being of the nation as well as to individual companies. I personally assure you that LTV will be an important part of this effort.

Clyde Skeen

COST EMPHASIS WILL CONT

Excerpts from contractors' replies to Se
questing intensification of industry's co

RCA—"Our formalized Cost Reduction Program is recognized as a sound business practice and is a key management responsibility at all levels in our company . . . You can be assured of my constant interest and personal support."—ROBERT W. SARNOFF, *President.*

NORTHRUP CORPORATION—"We have actively participated in this joint industry-government cost reduction program not only because we fully recognize and appreciate our basic obligation as a defense contractor but also because we have always regarded a sound internal cost and management improvement program as vital to the success and continued growth of our company."—THOMAS V. JONES, *President.*

GENERAL MOTORS CORP.—"Speaking for General Motors, I can assure you of our earnest intent to contribute to future savings to the best of our ability. It has been and continues to be our desire to produce defense material of high quality at the lowest possible economic cost, and to deliver it on schedule."—E. N. COLE, *President.*

PAN AMERICAN WORLD AIRWAYS—"We recognize . . . the vital need to achieve maximum efficient reduction in the cost of our Defense effort. You may be sure that I personally have this in mind and have issued appropriate directives to our people to generate such savings in the future as they have in the past."—H. E. GRAY, *Chairman of the Board.*

VITRO CORPORATION OF AMERICA—"* * * you can be sure that Vitro will continue to put greater and greater effort behind Cost Reduction."—FRANK B. JEWETT, JR., *President.*

IBM—"* * * I agree completely that while the results to date have been gratifying, it is vital to both business and the Government that we continue to exert our concentrated efforts toward further savings."—T. VINCENT, LEARSON, *President.*

LOCKHEED AIRCRAFT CORPORATION—"* * * As you know, Lockheed has been an enthusiastic and active participant of this program since its inception. Each of our operating divisions consider cost reduction as a major part of their total activity, and we feel our record of accomplishment to date has been quite good. However, as you point out, the potential for even greater accomplishment is always present."—A. CARL KOTCHIAN, *President.*

LEAR SIEGLER, INC.—"I have taken the liberty of sending copies of your letter of May 15, 1968 to all of our division presidents that work under Department of Defense contracts.

"Be assured that our company will exert the utmost effort toward supplying defense materials at the lowest possible cost."—JOHN G. BROOKS, *Chairman of the Board.*

UNITED AIRCRAFT CORPORATION—"At United Aircraft Corporation's six operating divisions active programs of cost reduction are under way on a continuing basis. Our cost reduction efforts are directed at all our activities and programs, including fixed price contracts and commercial as well as military business."—W. P. GWINN, *President.*

OLIN MATHIESON CHEMICAL CORP.—"I am writing in reply to your letter of May 15th in connection with the effort of major defense contractors to reduce the cost of Defense procurement.

"You can be sure that we will continue our efforts to this end."—GORDON GRAND, *President.*

HOLSTON DEFENSE CORP.—"I am sure that such success as Holston Defense may have had in this direction is owing to the continuing interest shown by the Department of Defense in cost reduction and to the cost consciousness of the Eastman-trained men whom we have assigned to the management of this subsidiary of the Kodak Company."—R. C. BURTON, *President.*

FEDERAL CARTRIDGE CORP.—"Needless to say, we share a common objective in reducing the cost of defense procurement. Your letter serves as a reminder that all employees can participate in working toward that goal."—C. L. HORN, *President.*

GENERAL PRECISION SYSTEMS, INC.—"* * * I assure you that we will continue unrelenting efforts toward further progress. Our motivation is twofold since significant cost reduction in the defense industry not only contributes to our Nation's strength but also to the attainment of the standard of excellent performance which is our prime objective at General Precision Systems, Inc."—LLOYD L. KELLY, *President.*

MASON & HANGER-SILAS MASON CO., INC.—"We agree that the success of this program in past years should be only a base for ever increasing effort to save defense dollars. . . . Both as defense contractors and as taxpayers we are 100% in support of your cost reduction program. You can count on my personal help, in assuring the success of your program."—W. ARNOLD HANGER, *President.*

NUE, CONTRACTORS PLEDGE

ry Clifford's letter of May 15, 1968, re-
duction efforts under Defense contracts.

THE BOEING COMPANY—"We at Being recognize the importance of sustaining our cost reduction efforts and assuring that DOD is achieving full value for every dollar spent in support of our national defense."—T. A. Wilson, *President.*

BEECH AIRCRAFT CORPORATION—"For many years we had the usual cost reduction programs such as Employees Suggestions and Work Simplification. However, our company-wide Opportunity for Improvement Program organized in 1964, which coordinated all of our many existing programs as well as introduced new programs including Zero Defects, has produced more substantial savings to both our commercial and aerospace customers."—Frank E. Hedrick, *President.*

ATLANTIC RESEARCH CORPORATION—"As a participant in this very important program, please be assured that you will continue to receive the full cooperation of the management of the Atlantic Research Group of The Susquehanna Corporation and its employees to achieve even greater savings in the future."—Emmett H. Bradley, *President.*

AAI CORPORATION—"Our program has produced steadily increasing results over the last three and a half years and we look forward to surpassing all our previous performance in 1968."—Robert B. Chapman III, *President.*

ELECTRO OPTICAL SYSTEMS, INC.—"Please rest assured that the support the Department of Defense has received in the past will continue and every effort will be made to improve our record."—S. C. Sigoloff, *President.*

LITTON INDUSTRIES, INC.—"We are proud participants in this program and I want to take this opportunity to assure you that Litton Industries continues to hold one of its foremost objectives the policy of transferring company ingenuity into impressive savings wherever and whenever possible."—Roy L. Ash, *President.*

WESTINGHOUSE ELECTRIC CORPORATION—"Cost improvement is a subject of vital interest and continuous emphasis in the Westinghouse Electric Corporation."—D. C. Burnham, *President.*

NORTH AMERICAN ROCKWELL CORPORATION—"Many of these cost savings have of course resulted in direct and tangible benefits to our company as well as reductions in the cost of Defense procurement."—J. L. Atwood, *President.*

ARNOLD RESEARCH ORGANIZATION, INC.—"The department of Defense and the Air Force can depend upon ARO, Inc., to continue to put forth our best efforts in this important work."—R. M. Williams, *President.*

AEROJET-GENERAL CORPORATION—"We at Aerojet fully support the program not only because we appreciate the critical need for the government to acquire defense materials at the lowest possible cost, but also because our contract structure and the competition for new business have made us highly cost conscious in our own self interest."—Reginald I. McKenzie, *President.*

HONEYWELL, INCORPORATED—"Cost reduction is mandatory for business growth and financial health of a company. The increasing competitive environment in defense contracting requires a contractor to exercise all techniques effectively in obtaining the maximum productivity for the dollar."—Stephen F. Keating, *President.*

HUGHES AIRCRAFT COMPANY—"Please be assured that cost reduction will continue to be of vital concern to me and to all levels of the Hughes Aircraft Company."—L. A. Hyland, *Vice President and General Manager.*

INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION—"We agree that much can still be done in government and industry to improve the true cost of equipment and services purchased by DOD."—Jack H. Vollbrecht, *Group Executive Defense-Space Group.*

THE MAGNAVOX COMPANY—"It is encouraging to see your own great interest in this important subject. . . . Related to this whole matter, of course, is our country's serious economic problems. These must be resolved and we agree with you that a part of that solution will come from maintaining Defense Procurement at the lowest possible cost."—R. H. Platt, *President.*

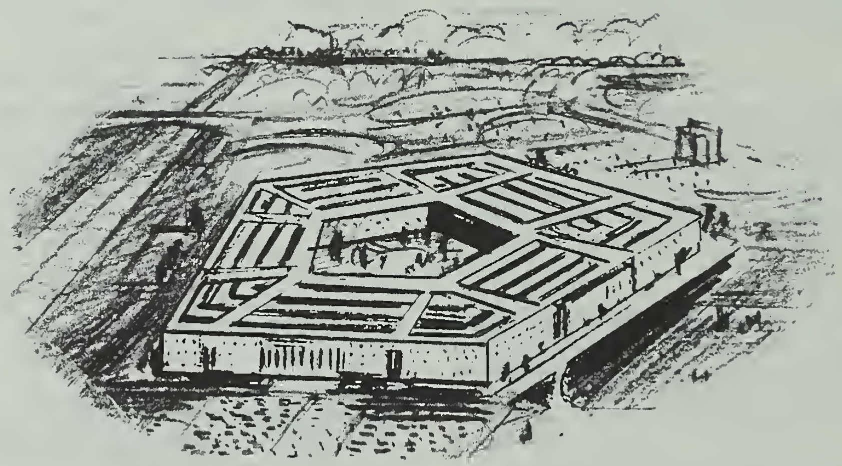
PRD ELECTRONICS, INCORPORATED—"PRD has operated an effective formal cost reduction program for the past six years and has recently joined the Department of Defense's Cost Reduction Program. . . . Please be assured that we shall do our share in helping meet DOD's goals."—Grayson Merrill, *President.*

SYLVANIA—"Through direct participation, endorsement, and policy statements Sylvania management has stressed the need for an aggressive and effective cost-reduction program, and will continue to do so."—Henry Lehne, *Vice President and General Manager.*

PROFITS ON DEFENSE CONTRACTS

. . . those who express alarm about "profiteering" are making assumptions as to the future without a factual basis.

—Clark M. Clifford, Secretary of Defense



On June 13, 1968 the Secretary of Defense sent the following letter to:

- Senator Richard B. Russell
  Chairman, Senate Armed Services Committee
  United States Senate

- Congressman L. Mendel Rivers
  Chairman, House Armed Services Committee
  United States Congress

- Congressman George H. Mahon
  Chairman, House Appropriations Committee
  United States Congress

THE SECRETARY OF DEFENSE
WASHINGTON, D. C. 20301

13 JUNE 1968

Dear Mr. Chairman:

During recent weeks there have been several Congressional and press comments implying that there has been a sharp increase in profits on Defense contracts—or expressing concern that the increased volume of Vietnam procurement has given rise to "war profiteering".

I have examined the best available data on this matter and do not find a basis for such conclusions. I would like to report to you on the data which this Department has available.

We continue to strive for maximum effective competition in procurement, at minimum costs possible. I acknowledge that some mistakes are inevitable, but the facts tell a story of significant progress in military procurement.

The Defense Department is now processing approximately 15 million purchase transactions annually. While most of these are small, we entered into more than 229,000 transactions last year with a face value of $10,000 or greater. In such numerous transactions, spanning purchases ranging from simple parts and services to the most complex weapon systems, there will always be a range of profit results—from occasional substantial losses to occasional instances of relatively high profits. To protect the public against any abnormal trend to high profits, Congress has established the Renegotiation Board. We support the continuation of the Board.

Permit me now to relate to you the factual data which are available.

Published Reports of the Renegotiation Board

As you know, the Renegotiation Act of 1951 provides that the Renegotiation Board is to review the total profit derived by a contractor, during the year, from all of his renegotiable contracts and subcontracts in order to determine whether or not this profit is excessive. Each year the Board reports the total sales contained in the filings it receives, and the total profit on these sales. The tabulation below, from the Renegotiation Board reports for 1956–1967, shows sales and pre-tax profits, and the overall percent of pre-tax profit on sales.

Year ending June 30	Renegotiable sales	Renegotiable profits	Profit on sales
	(Billions)	*(Billions)*	*(Percent)*
1956	$28. 2	$1. 8	6. 5
1957	27. 7	1. 6	5. 8
1958	26. 6	1. 3	4. 9
1959	26. 3	1. 1	4. 2
1960	28. 5	1. 1	4. 0
1961	25. 1	0. 9	3. 6
1962	29. 3	0. 9	3. 1
1963	31. 2	0. 9	2. 9
1964	39. 3	1. 1	2. 9
1965	34. 8	1. 0	3. 0
1966	31. 8	1. 0	3. 0
1967	33. 1	1. 2	3. 5

It is reported that, due to Vietnam, the number of filings with the Renegotiation Board has begun to show an increase. This, of course, is to be expected. The number of contract awards with a face value of $10,000 or greater has increased from 149,700 in 1963 to 229,400 in 1967. During the same period, the net value of Defense awards increased from $29.4 billion to $44.6 billion.

Based on the above data, I find no grounds for concluding that a sharp increase in Defense profits has occurred. To the contrary, Department of Defense officials frequently have expressed concern with the steady decline in profit rates between 1956–1963. This was one of the factors that led us to conduct a—

Special Study of Profits Earned by Forty Defense Hardware Contractors.

Two years ago, the Defense Department determined that more detailed information was required on profit trends related to sales, capital invested, and type of contract—especially among companies engaged in the development and production of military hardware. We obtained the assistance of a research organization (the Logistics Management Institute) to gather such detailed information on a confidential basis from a number of medium volume ($25–$200 million annually) and high volume (over $200 million annually) Defense contractors. The survey covered 40 companies (23 high volume and 17 medium volume). This group represents a significant sample, since its aggregate Defense sales have ranged between $13–$15 billion annually since 1958. Thus far, sales and profit data have been obtained and analyzed for the calendar years 1958 through 1966. We are currently in the process of obtaining data covering earnings through Calendar Year 1967.

The following summary shows the profit performance, before taxes, for this group of Defense companies, compared with 3,500 durable goods companies reporting to the Federal Trade Commission and the Securities and Exchange Commission.

Year	40 defense companies		3,500 FTC/SEC companies	
	Profit to sales	Profit to total capital invested	Profit to sales	Profit to total capital invested
	(Percent)	*(Percent)*	*(Percent)*	*(Percent)*
1958	5. 4	20. 4	7. 1	14. 1
1959	5. 1	19. 1	8. 9	18. 8
1960	4. 5	17. 0	7. 8	15. 9
1961	4. 3	14. 6	7. 7	15. 1
1962	4. 2	14. 3	8. 9	18. 5
1963	3. 9	12. 5	9. 1	19. 2
1964	4. 0	12. 2	9. 5	20. 4
1965	4. 8	14. 3	10. 4	23. 1
1966	4. 5	13. 0	10. 0	22. 6

As the above data show, the trend in Defense companies' earnings has been downward, while that of the commercial companies has steadily increased. The Logistics Management Institute has also obtained data on Defense company profit trends by type of contract. These show that the lowest profit rates since 1963 have been earned on firm-fixed-price contracts, and on those awarded under competitive conditions.

A copy of the study containing the above data is enclosed. When this report is supplemented to show 1967 data, we will be pleased to furnish you a copy if you wish.

Trends in "Going-In" Profit Rates on Negotiated Contracts

A misunderstood and misinterpreted profit statistic which has been discussed recently is the negotiated "going-in" profit on noncompetitive contracts. Some people apparently assume that this profit is a guarantee of what the contractor will actually earn when the contract is completed. This is not the case. It simply means that if the contractor's actual costs are the same as the estimated, allowable costs established by negotiation—then he can expect to earn the profit percentage which is negotiated. However, costs incurred above the negotiated estimate, (1) either do not change the amount of profit negotiated, or (2) decrease the amount earned—depending on the type of contract. Hence, the contractor's profit percentage can be expected to decrease to the extent that his actual costs are higher than negotiated at the outset—a very frequent occurrence on development and initial production of complex military items.

Furthermore, by law and regulation there are many contractor costs which are not allowed on Government work and which thus must be paid by the contractor out of his profits. These unallowable costs include interest on borrowed capital, donations and contributions, advertising, and others; in the aggregate such unallowables average in excess of 1.5% of the contractor's actual costs.

The statement has been made that since 1964 "going-in" negotiated profits have increased 25% over the 1959–1963 period. The actual increase from January 1, 1964 through December 31, 1967 has been 22%. A principal reason for this increase in "going-in" profit rates is the fact that we have consistently increased the use of firm-fixed-price and incentive type contracts, while reducing the use of cost-plus-fixed-fee (CPFF) contracts. This shifts responsibility and risk from the Government to the contractor, and provides an incentive for better management. Our experience shows that the *total cost* to the Government is thereby reduced. Hence, it is sound practice to share the cost savings with the contractor.

Since 1961 the percent of awards based on firm-fixed-price contracts has increased from 31.5% to 56.3% of all awards; incentive contracts have increased from 14.4% to 26.1%; while the percent of CPFF awards has dropped from 36.6% to 10.4%. We would indeed be exacting unreasonable penalties if such dramatic shifts in risk were not accompanied by improved profit *opportunities.* As a consequence, the average negotiated "going-in" profit has increased from 7.7%, on estimated cost, to 9.4% since January 1964—a 22% increase.

Despite this apparent improvement in profit opportunities, the limited data available to us thus far on completed contracts show no improvement in realized profits—that is, they are remaining at the 1959–1963 level. We are currently examining why the anticipated improvement has not occurred, because we cannot properly expect industry to accept greater risks, and to apply an ever larger share of their own financial resources to the performance of complex military undertakings, without a valid opportunity to obtain profit results commensurate with the lower cost to the Government. Unless such improvements do occur in the future, we can only expect strong pressures to revert to much greater use of CPFF type contracts. I am sure that you will agree, as I find industry leaders do, that this would be a retrogressive step.

Conclusion

In the light of the above evidence, I can only conclude that those who express alarm about "profiteering" are making assumptions as to the future without a factual basis. Of course, no one can predict future results in each individual contract or company. It is possible that the high volume, long production runs, which characterize some Vietnam procurement programs, may produce different patterns of profits from those of the past seven years. Again, it should be noted that the Renegotiation Board has been established to protect the taxpayer against any individual instances of excessive profits.

I can assure you that we will continue to keep Defense costs and profits under the closest scrutiny; that we will continue to pursue the objective of wisely using the profit motive and competition to attract the best industrial capabilities to Defense work, and reward contractors appropriately for their performance as measured by on-time performance, technical achievements, and cost.

Sincerely,

Clark M. Clifford

Enclosure

THE DEFENSE LOGISTICS SERVICES CENTER

MILITARY USE OF DSA SERVICE STRETCHES TAX DOLLARS NEARLY TWO BILLION

TAX DOLLARS allocated for defense supplies were stretched to the tune of nearly two billion dollars during the past three and one-half years because the military services use a program that now makes it easier for them to locate and use excess items in lieu of buying new ones.

It is difficult to comprehend such a large amount of money. Perhaps an analogy will help—The biblical character Methuselah would have had to save over 2.6 million dollars every year of his 969 years on earth to amass 2 billion dollars * * * Put another way, that's the amount of individual federal income and other employment tax receipts remitted to Uncle Sam for 1966 by residents of the State of Indiana.

Called the Department of Defense Materiel Utilization Program, it is one of the cost-reduction services provided to military and civil agency customers through the highly computerized Defense Logistics Services Center (DLSC).

DLSC is located in Battle Creek, Michigan and is a major field activity of the Defense Supply Agency.

Serves as Broker

Satisfying defense supply requirements at less cost is now becoming old hat because utilization-minded people in the military services, at our headquarters and at our Defense Surplus Sales Offices (DSSOs) are exploiting our brokerage-type service—one of the three major services we provide to help our customers achieve more supply efficiency.

Since July 1965, we have offered nearly 3½ billion dollars worth of excess items to military customers who needed supplies excess to other military establishments. Approximately 50 percent of this was actually transfered to meet other service requirements.

We use three techniques to come up with items needed by the military customers. Two involve use of sophisticated mechanized programs.

Although we are rapidly mechanizing this "swap shop" or brokerage service, much of the cost savings attributable to use of our services were accomplished because retail (Post, Camp and Station) customers take the time to screen our computerized printed listings of items excess to defense needs that we publish each week. Since July 1965 over 435 million dollars worth of excess was actually selected to satisfy needs from two billion dollars worth offered in these listings. The items offered in these listings range from unused-new to used-poor condition.

Customer use of a computerized (mechanized) system that automatically matches needs of wholesale item managers with excess was responsible for the referral of over 1.4 billion dollars worth of supplies during this time frame.

In July of this year a new mechanized "feedback" system will tell us precisely how much of the excess referred by the computer is actually accepted by customers.

Alternative Applications Exploited

The use of direct mail flyers and brochures and telephone solicitation techniques supplements the mechanized and manual efforts. These media are used in an attempt to satisfy requirements with high dollar value excess materiel.

By **CAPTAIN R. A. PORTER, SC, USN**
Commander, Defense Logistics Services Center (DLSC)

Since fiscal year 1965, application of direct mail flyers, brochures and telephone methods achieved 566 million dollars worth of transfers.

The brochures are used to help our DoD customers satisfy their needs with items excess from phased-out weapons systems. * * * One would think such items unique, therefore having limited application * * * but not our utilization people. They are innovators.

Through customer cooperation, that often involves product research, they suggest alternative applications for thousands of items. During fiscal year 67 their tenacity, spurred by military service cooperation, helped the military services transfer for further use 257 million dollars worth of weapons systems excess.

Surplus Also Searched

Another mechanized technique includes a last minute comparison of customer needs with items scheduled to be sold as surplus to the public. Nearly 23 million dollars worth of supplies were referred to customers because of this technique.

There are many interesting examples of utilization accomplishments attributable to not only the alertness of military and government civilian personnel, but to businessmen.

These accomplishments are the products of a continuing desire on the part of an increasing number of members of the defense-industry team to reduce costs.

For example: Recently our San Diego Defense Surplus Sales Office (DSSO) personnel noted that one million square feet of steel landing mats located at an Air Force base, valued at $350 thousand, were scheduled to be sold as surplus. Aware of a last minute demand for such items, our sales personnel forwarded the information about them to us in Battle Creek. We promptly found that the Army needed the mats and they were transferred.

Utilization-minded government supply people also try to extend the use not only of expensive items but also relatively inexpensive, critical items. For example, San Diego DSSO personnel recently helped DLSC transfer 230 excess shopping carts from the Air Force to a naval supply center and a naval air station in time to placate irate shoppers.

Another example: The former Tucson DSSO received a request to sell 9,773 board feet of lumber. Joint efforts with DLSC and the Marine Corps resulted in a transfer of the lumber to a Marine Corps air station. Estimated proceeds from the sale of the lumber as surplus would have been approximately $100. Not much in dollar savings but it illustrates the payoff tax-

A DLSC PROFILE

Imagine an industrial enterprise involving a cataloging operation 28 times larger than that of Sears, Roebuck and Co., one of the world's largest brokerage houses, an industrial marketing operation as large as the Xerox Corporation and probably the world's largest supply item data bank—all under one roof. That's the size and composition of the Defense Logistics Services Center, a Defense Supply Agency activity created to help its customers reduce the cost of government.

DLSC manages four interrelated programs; the Federal Cataloging System, the Department of Defense Utilization Program, the Department of Defense Surplus Sales Program and an Integrated Data System.

The cataloging program involves vital data on 4.3 million items and is the principal repository and processor of supply item intelligence used by the entire U.S. Department of Defense; scores of civil agency inventory managers and 13 NATO and other friendly foreign governments.

Over 64-thousand manufacturers located worldwide are registered there.

The utilization program which could be considered one of the world's largest brokerage houses helps government customers satisfy their materiel requirements with items that initially appear excess to the government. Much of this matching of requirements with excess is accomplished by computers.

Last fiscal year, DLSC referred over three fourths of a billion dollars worth of defense excess to needy customers.

DLSC's marketing operation, which encompasses a network of 10 sales offices, uses modern industrial marketing techniques to obtain top dollar for defense items no longer needed in government. During the last fiscal year these offices conducted over 1200 sales involving items which once cost taxpayers over one-half billion dollars.

DLSC's unique services are provided by over 900 employees in Battle Creek and over 250 in its sales offices.

Because the services DLSC provides are exploited by its customers the cost of government has been reduced by billions of dollars in less than a decade.

payers are receiving because DLSC and its customers are taking the extra step.

Other examples illustrative of alertness are cited.

A merchandising specialist at our Columbus, Ohio DSSO was asked by a military customer to help identify surplus bearings in preparation for a sale. The specialist determined that they were the type used not only on universal joints connecting the final drives and transmissions for tanks, but on the motor carriage of 76 mm guns. It seemed logical to him that the bearings could be used in vehicle repair kits. Result? Three thousand bearings that cost $50,000 were retained by the Government for further use.

System Supplies Scarce Items

Another advantage of using excess items in lieu of new procurement is the immediate availability of scarce items. This cannot be measured in dollars and cents.

For example, personnel of a naval air station desperately needed small aluminum tubing caps to accomplish the repair of various types of aircraft.

Using our mechanized screening process we located 700 caps at an Air Force base in Tennessee.

Athough the caps were scheduled to be sold as surplus, the base property disposal officer recovered the caps in time for shipment to the naval air station. The Navy put a price tag of $1,450 on this materiel.

Granted, the dollar value of the materiel was small. However, our utilization experts ask "what is the price on aircraft flying time which could have been lost to the Navy during the time it would have taken to buy and perhaps make the small but nevertheless critical items if DLSC had not come to the rescue?"

Tips to our sales people from two surplus buyers in two instances permitted utilization of nearly $300,000 worth of items that would have been sold as surplus.

President Cites DLSC

The President is aware of DLSC's service and its potential. On Sept. 16, 1966, in a memorandum to the heads of departments and agencies the President singled out DLSC for special praise while outlining steps to insure the continuing health and strength of our economy.

He urged the recipients of the letter to (quote): "Develop an effective system for redistributing Government property to the places where it is needed most. I am aware of the excellent work along this line which has been accomplished through use of electronic data processing systems at the Defense Logistics Services Center in Battle Creek, Michigan. This work should be accelerated and should provide a means not only for redistributing excess property but also for improved utilization of inventories which have not been reported excess and which should not be disposed of as surplus."

Service is DLSC's Business

It certainly appears that his admonishment is being heeded because the utilization philosophy is becoming commonplace within the DoD structure and is spreading to industry members of the defense/industry team.

Members of my staff stand ready to tell logisticians at all levels of the defense/industry team how they can benefit from our customer oriented services. This can be accomplished through personal briefings or print media and soon through an audio visual program.

Providing services to help you with your arduous logistics tasks is our business. ☐

(*DOT, continued from page 6*)

for major issues and gives the Secretary ready access to the expertise available in the administrations.

In such a council, it is realized that the head of each administration will speak primarily for his respective mode of transportation. He will be expected, however, to go beyond these limitations and provide objective advice in setting overall transportation and Departmental policy.

This concept does not envisage a multiheaded organization in which the Secretary is rendered incapable of exerting effective total leadership, for the Secretary will still make major decisions. Rather, it will free the Secretary to concentrate on primary policy issues and speak with a strong voice in confidence that his energies have been focused on these issues by direct consultation with his principal advisors. It provides an organization by which the Secretary, in harmonizing the legitimate demands of the various transportation interests, can develop a total transportation policy to meet the current and future needs of the country.

The previous discussion demonstrates the diversity of institutional background of the organizations which have been brought into the Department. Although there is a stated and workable general concept of organization and management for the Department, the unification of its management systems has only begun.

The progressive perfecting of arrangements for field cooperation and administrative support and the development of techniques to utilize fully equipment and facilities present major challenges, because we are determined to get more out of the resources entrusted to the Department than was possible prior to the Department of Transportation Act.

As the Department of Transportation begins its second year we still don't have many answers but at least we are somewhat better positioned to identfy the questions. Having come through a similar formative period the Department of Defense will understand better than most that in a reorganization of this size if you can run fast enough the first year to just stand still you enjoy a small sense of accomplishment. ☐

About People Here and There

CASH AWARDS TO ARMED FORCES—
Message from the President

The President of the United States sent the following message to the Congress on May 15.

To the Congress of the United States:

I am happy to transmit to the Congress reports of the Secretary of Defense and the Secretary of Transportation on cash awards to members of our Armed Forces for noteworthy suggestions, inventions, or scientific achievements.

The cash awards program, first authorized by Congress in September 1965, has proved an excellent incentive for reducing costs and increasing efficiency in the Armed Forces.

The largest percentage of awards—89 percent—continues to be in the $50 and under range. Of the 34,527 awards, however, 1,094 awards were over $250. The total amount paid in awards for suggestions in 1967 was $1,307,832.

In the Department of Defense, over $63,000,000 in first-year benefits have resulted from suggestions submitted by military personnel during 1967. In the Coast Guard, since the inception of the program, benefits have amounted to over $391,000. This raises the total amount of tangible benefits received during the relatively short life of the program to over $119,000,000. Many additional benefits not measurable in dollar amounts have resulted from suggestions concerning safety and other matters.

Few investments of public funds have ever returned such prompt results in economy and efficiency. Few forms of recognition have so widely benefited the morale or encouraged the initiative of our men and women in uniform.

I urge every Member to examine the truly remarkable and encouraging achievements described in these reports of the Secretary of Defense and the Secretary of Transportation.

LYNDON B. JOHNSON.

THE WHITE HOUSE, *May 15, 1968.*

AF SERGEANT RECEIVES $1200 AWARD

Technical Sergeant Charles D. Cooper of Scott AFB, Ill. is $1,200 richer today because he found a more efficient, less costly way to transport an Air Force mobile air navigational aid. His idea saved the Air Force $129,850.

The award, made at Air Force Communications Service Headquarters at the base, is one of the highest ever paid to a member of AFCS.

Sergeant Cooper, 34, is the non-commissioned officer in charge of the Flight Facilities Maintenance Section of AFCS' 3rd Mobile Communications Group at Tinker Air Force Base, Okla.

He suggested that a Tactical Air Navigation (TACAN) unit be mounted on a flatbed trailer together with its supporting equipment, two generators and an air conditioning unit. Previously, the TACAN and supporting equipment required two trucks and two trailers to transport to areas where 3rd Mobile personnel were deployed on missions.

Sergeant Cooper, in pursuit of his idea, acquired a surplus flatbed trailer and mounted the equipment during off duty hours. The configuration was service-tested during several of the unit's field exercises. Since then two additional TACAN units have been mounted on flatbed trailers and a fourth one is in the process of being mounted. Information on the configuration also has been sent to AFCS' four other mobile communications groups to determine whether the idea can be utilized in their operations.

The TACAN is an extremely reliable and valued navigational aid for pilots. Its automatic and unmanned ground equipment provides the pilot with the direction of his aircraft relative to the facility, aircraft bearing, the distance from the facility and whether the aircraft is headed toward or away from the station.

The largest item in the validated savings is for site surveys. The TACAN unit is used to determine the geographical setup for emergency mission operations. The surveys require the use of an aircraft to determine the most feasible location to set up the mobile communications operations. As a result of Cooper's suggestion, the TACAN can now be set up and tested in 40 minutes compared with four hours previously. Thus, six possible sites could be surveyed in one day as compared with two in the past. Other items of savings include less fuel consumption, vehicle upkeep, reduction in number of truck drivers, and labor required to position and connect the equipment.

Sergeant Cooper has been assigned to the 3rd Mobile Communications Group for two years. The Group responds to the emergency mission support requirements of AFCS, a globally operating command which provides communications, air traffic control and air navigational aid services and facilities for the Air Force and other government and civilian agencies. Its 54,000 people serve in over 600 units in 45 states and nearly 40 foreign countries.

COLONEL SAVES CASH

A retired Army Lieutenant Colonel has saved $4,725 for Eglin AFB (Florida) through the Air Force Cost Reduction Program.

Army Lieutenant Colonel (Ret.) William D. Harris, an instructor with the Disaster Control School here, suggested a $25 replacement for a $4,750 machine used for training in the school.

The Radiation Survey Training Set formerly used by the school provided a degree of realism in the training but was expensive and difficult to operate. Colonel Harris determined that a much better training program could be accomplished using available alpha-emitting isotopes of low intensity at a cost of $5 per unit.

Colonel Harris' present plans are to purchase three alpha-emitting isotopes and make use of radioactive isotopes emitting beta and gamma energy which are available for Air Force training purposes through the Office of Civil Defense.

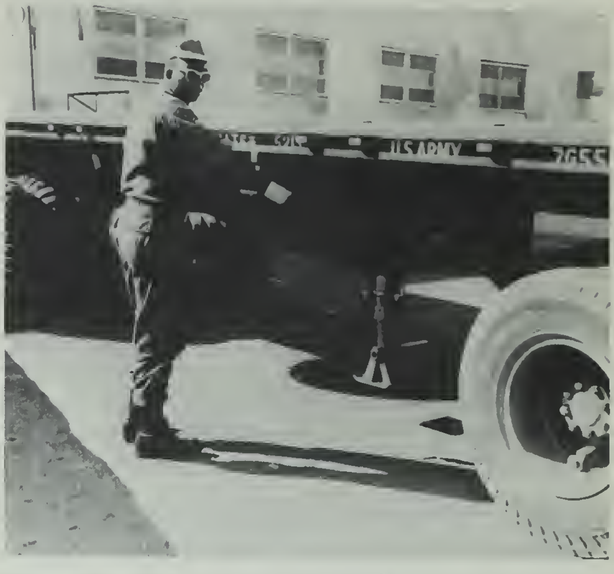
Colonel Harris has a Radioactive Materials license from the State of Florida which authorizes him to possess these materials.

He has been teaching at the school since June 1967. Before coming to Eglin, Colonel Harris served with the Army's 82d Airborne Division at Ft. Bragg, N.C.

REPAIRS BLADES FORMERLY SCRAPPED

The Parsons Corporation of California (at Stockton)—manufacturer and repairer of OH–23 Helicopter rotor blades—value engineered repair procedures so that blades previously required to be scrapped can now be made serviceable—saving the Army $237,390 in fiscal year 1968.

FOOTPADS KNOCKED OUT



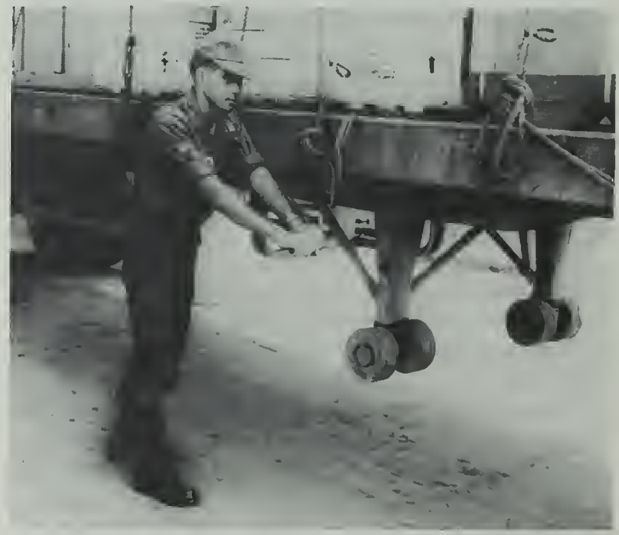
Before: With Legs

Although trailer legs are not a soldier's usual cup of tea, SP5 James P. Durbin did lift an eye when he learned that the 2d Logistics Command was losing an average of 50 per month at a replacement cost of $233 per pair.

Durbin found that the flat footpadded legs snapped off in hitching operations when backing trucks jolted trailers. Ever since Durbin suggested replacing the footpadded legs with rollers, things have been trundling along nicely—thank you.

Along with improved safety, one set of rollers lasts as long as 15 sets of the stand-still legs—rolling up a three-year saving of $441,200.

The Army awarded Durbin $655 for this free-wheeling idea.



After: With Rollers

OF BINS AND BATTERIES AND TRAFFIC TICKETS

Six Suggestion Awards presented recently at the U.S. Army Armor Center, Ft. Knox, Kentucky, totaled $804 and will save the Army an estimated $13,600 in the first year.

Richard C. Randolph, a civilian employee in the Student Supply Branch, S-4, School Brigade, received a $220 award for developing an improved numbering system for publication storage bins. The former sergeant major's suggestion should save $4,300 annually, and was his sixth winning idea.

Sergeant First Class Douglas Wells and Harley Beal won $175 each for recommending use of a DC rectifier instead of batteries to operate the AN/PRC-74 radio sets in the Communication Department's Support Division. The first-year savings total $7,000.

Captain Randolph D. Brock III, chief of the U.S. Army Armor School, received $110 for developing an improved form to process traffic tickets and MP reports which should save $2,100 in one year.

John L. Stoller, an employee of the General Subjects Department, received $100 for developing two one-hour units of instruction in effective listening for Armor Officer Advanced Course classes.

The final $25 award went to Specialist Five Richard A. Blakeman, mess sergeant of Company B, 2nd Battalion, School Brigade. He invented an improved silverware container for use in School Brigade mess halls.

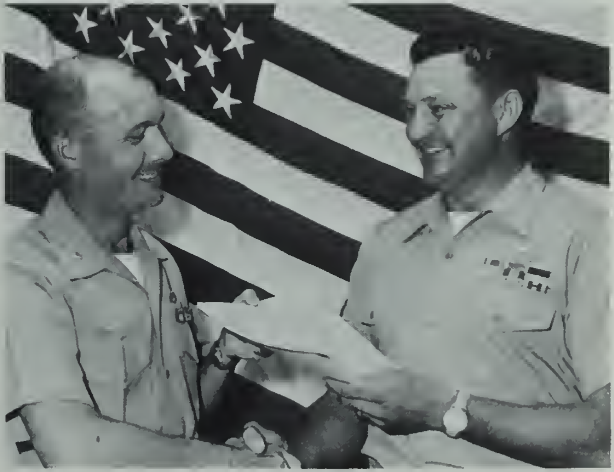
INVENTIVE INCENTIVE

In the photo at left, Gunnery Sergeant Richard L. Russell (center) and Staff Sergeant Richard N. Ranzo (left) receive congratulations and "thanks" from Major General Charles J. Quilter, former Commanding General of the 3rd Marine Aircraft Wing stationed at the Marine Corps Air Station, El Toro, Santa Ana, Calif. The two Staff non-commissioned officers received incentive bonuses totalling $1,050.

GySgt. Russell received $800 for redesigning the throttle box on the UH-34 Sea Horse helicopter while on board the aircraft carrier Valley Forge off the coast of Vietnam. Sergeant Russell's contribution saves the Marine Corps $200,000 annually.

Staff Sergeant Ranzo developed a special tool adapted to pulling and pressing in bushings for the lockpins on the rotor head of the CH-53 Sea Stallion helicopter. His device saves the Marine Corps $10,000 a year and over 100 working hours on each chopper. He was presented a check for $250.

In the photo at right, Gunnery Sergeant Charles L. Rodinsky, non-commissioned officer in charge of Headquarters and Maintenance Squadron-30's engine shop, accepts a voucher for $50 from Major B. R. Terhorst, squadron commanding officer, for his drawing board modification of the T-64 engine exhaust frame.



ARROW-DYNAMIC TEST

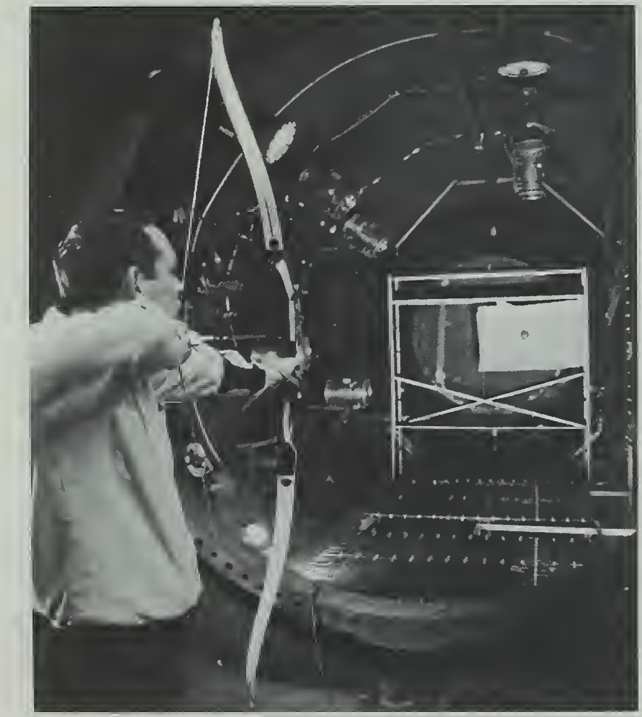
If he were around today William Tell, the legendary Swiss patriot (and part-time outlaw), would be all aquiver to see how modern archers at the Air Force's Arnold Engineering Development Center, Tennessee were able to topple $18,600 in costs with only four well placed arrows.

The Center, operated by ARO, Inc., needed sequenced photos of an object in flight to test cameras and lights newly installed in a high-altitude cell at its $400 million testing installation. The objective was to make certain that the photographic triggering mechanism functioned properly.

The initial plan called for launching four test vehicles at the Center's Rocket Test Facility to prove out the system.

However, the engineers looked around for other alternatives after considering the loss of four unrecoverable test objects and the extra time needed to prepare the cell to meet desired altitude conditions. Their brainstorming hit upon the idea of shooting arrows through the 80 foot test cell. Two employees, Ed Bradford and John Brown volunteered their talents as expert bowmen.

The engineers attached a triggering switch for the lights and camera to Bradford's bow. The first arrow (see photo) winged true to prove out the triggering system, but an unsuitable backdrop fouled up the photography. With a quick change in the backdrop, Brown took his turn. All systems were "go" when his arrows hit the target for an $18,600 pay-off.



BOEING PROGRAM SAVED $1600 PER EMPLOYEE

The Boeing Company reports that the 13,891 cost improvement ideas it received in 1967 saved an average $1600 per employee.

The ideas included:

- Using scrap wire in airplane mockups (saving $36,000)
- Changing grades of lumber used for construction purposes (saving $14,000)
- Eliminating most temporary shims bonded to aircraft horizontal stabilizers during factory assembly by making the stabilizer part of the aircraft in final assembly (saving $27,000)
- Reworking surplus spare parts and installing them on production airplanes, $20,000
- Relocating the wing-to-body joining area next to final assembly, thus eliminating duplicate tool rooms and facilities, $91,000
- Machining the trunnion pin of the 737 main landing gear from bar stock instead of using a swaging and finishing method, $119,000 ($337 a landing gear)
- Reusing heat shield curtains on the Saturn V rocket for static firing and ground tests, $113,000
- Using faster and cheaper hybrid computers for a "rough draft" of emergency detection system flight studies, and then employing a more accurate and expensive digital computer for the final detailed work, $1,148,000
- Assigning individual responsibility to shop mechanics for drills and rivet guns rather than checking these tools in and out each day, $230,000
- Establishing a load sequence center in the machine shop and having a small group assemble all "set-up kits" instead of having each machine shop operator assemble his own (saving $1.2 million)

PLUMBERS' SCRAPERS

Plumbers working for the Army Post Engineer in Franconia District, Wurzburg, Germany no longer replace calcified hot water pipes when occupants on the upper floors of buildings in the area complain about the lack of hot water. Instead, the plumbers now scrape away the calcium deposits.

The old practice was to dismantle the two-inch pipes connecting the central heating plant with the buildings, replace these with new, galvanized pipes and discard as worthless the old pipes that had been coated with the calcium. This costly method led the plumbers to invent a scraper that could be used along with their standard roto-rooter equipment. The new procedure is simple: disconnect the pipes at several spots, insert the scraper, flush and reconnect. The old pipes became as good as new and labor and material costs are 75 percent less.

UNIQUE SHIP UNIQUELY DEFUELED

An about-to-be demolished vessel, believed undefuelable, formed the setting for a unique cost reduction.

The USS Guavina—Navy's only submarine oiler (vintage 1943)—was scheduled for the deep six with 250,000 gallons of diesel fuel aboard. While defueling a ship is routine procedure before disposal, the Guavina's ancient piping system, pier safety regulations, and the absence of barges and tank trucks added up to a no-defueling decision in this case.

That was before the Fuel Division at the Norfolk Naval Supply Center really sank its teeth (as well as hoses and pumps) into the problem.

Due to the Guavina's age and her uniqueness it was necessary to find someone still in the Navy who knew the piping system so that men from Submarine Squadron Six could pump the fuel from her tanks. SubRon Six found such a man after many inquiries.

Since the sub was "dead plant"—that is, without power, she could not use the normal fuel pier at Craney Island. Safety regulations prohibit ships without power from using the fuel pier there.

Finding a fuel barge to use for the 3- to 4-week period required for defueling proved to be a problem, too. None of the available barges could be tied up for that length of time and using a commercial barge was too expensive. Fuel Division officials considered using a sludge barge, but that idea was rejected because it would have contaminated the diesel grade fuel and caused it to be downgraded—thus reducing the savings involved.

At one time, a fuel truck was suggested to transport the fuel to Craney Island, but there was not one available that could have made the 46 trips to Craney that this method would have required.

As a last resort, the Fuel Division personnel decided to use one of NSC's gasoline barges to accomplish the defueling. But first, it had to be "gas freed" to remove traces of volatile vapors that would have also caused contamination.

Once the barge was selected, the Guavina was towed to the nearby Destroyer-Submarine Piers, where she was permitted to stay until the fuel transfer was completed. All pump power for the operation was auxiliary, since the sub could not provide any.

Since the defueling, the diesel fuel removed from the Guavina has been reprocessed and blended at Craney Island and reissued to other ships.

The Guavina, minus 250,000 gallons of diesel fuel, was blown up in November about 90 miles east of Norfolk off the Virginia coast.

Sparkplugging the defueling venture were: LCDR R. J. Girman and Messrs. Stanley Leonard and Claude Avery—all of Norfolk Naval Supply Center.

USS GUAVINA

DEFUELING

DESCENDING

AIR FORCE COMMUNICATIONS SOUND ECONOMY MESSAGE

Perrin AFB, Texas, an Aerospace Defense Command base, saved $8,400 by improving the method for repairing the AN/ARN-21C Tacan Receiver.

Under the old procedure, the module was removed from the main chassis and a patch cable attached, and voltages and wave forms were checked by locating a specific resistor, capacitor, inductor or tube and taking a reading from a specific pin, terminal or component. This necessitated constant reference to technical orders and charts to determine whether the reading was correct, resulting in considerable loss of time. In addition, there was the constant danger of the test probe slipping off the test point, causing a short circuit and damaging the module or the test equipment.

The new method, developed after intensive study by communications specialists, utilizes a test jig which is coupled to the main chasis by its own patch cable. Test points from the module are brought to the jig and to individual test jacks by a system of internal wiring. Then, the test probe is plugged into the test jacks, and voltages and wave forms are read on the oscilloscope The voltages can be compared to proper readings permanently displayed below each test jack; hands are freed from holding the test probes, and the danger of the probe slipping and causing a short circuit has been eliminated.

Using this new test jig has reduced from 4 hours to 1½ hours the time required to check out one module, and makes diagnosis of malfunctions more accurate, resulting in fewer parts being changed needlessly. The $8,400 saving is calculated on the basis of repair of 720 modules during the year.

And a communications survey at Ent AFB (Colorado) disclosed that—

- Two new teletype machines in the same building do not produce twice the news that one does. (One was removed forthwith, saving leasing costs of $1,900 a year.)
- An ordinary telephone could replace a complex intercommunications system costing $247 a month to operate and maintain.

And at Goose AB (Labrador), Capt. John M. Haga canceled the lease on a teletype circuit renting for $1,033 per month when his study showed that available AUTODIN circuits could easily handle the additional traffic.

And at Langley AFB (Va.) some astute observation showed that special communications circuit and data processing equipment (rental: $6,000 a year) for transmitting and receiving supply data between Langley AFB and Hill AFB (Utah) could be dispensed with by relying on:

- direct military-leased telephone lines or teletype for priority matters
- punched cards for routine matters

And a management engineering study by Capt. Victor M. Grabrian resulted in consolidating two Air Force Communications Service Units at McClellan AFB (Calif.), saving the taxpayers $103,700 by reducing manpower authorizations. The units consolidated were:

- The 2049th Communications Group responsible for the U.S. Air Force and Defense Communications System long-haul communications to the Pacific area, including operation of the West Coast gateway switching station of the Automatic Digital Network (AUTODIN).
- The 2033rd Communications Squadron responsible for operation and maintenance of base communications, air traffic control and air navigational aid facilities at the base.

KEY PRY GIVES WHEELS A BRAKE

It may look like a dentist's pry but it is really a re-worked piece of scrap metal that saves time and dollars at the Naval Air Rework Facility, Pensacola, Florida.

Braking action in wheels of F9J fighter aircraft begins when the main wheel key contacts rotating discs within the drum. Hammer or chisel leverage to remove the key during overhaul often damaged the wheel. The pictured instrument, fashioned from dross, now safely pulls the key and cuts disassembly time from 15 to 5 minutes—saving $1,000 annually at this single facility.

ST. LOUIS VE SEMINAR

A highlight of the VE Seminar was the presentation of a Certificate of Achievement and a check in the amount of $26,300 accepted by Mr. Ford Fisher, military sales manager of the Parsons Company, Traverse City, Michigan, and presented by Colonel Delbert Bristol, Deputy Commander of the Army Aviation Materiel Command, St. Louis, for VE savings to the Government of $263,000. The Stockton, California, Branch of Parsons Company implemented a VE project of renovating damaged and worn helicopter propellor blades which had previously been scrapped.

Four military agencies and the Gateway Chapter of the Society of American Value Engineers jointly sponsored a two-day Value Engineering seminar, which attracted 150 defense industry and military agency representatives to St. Louis in late March.

Key speaker for the seminar was George E. Fouch, Deputy Assistant Secretary of Defense, who discussed "The Department of Defense Value Engineering Program". William B. Dean, Manager of Value Engineering, Honeywell Inc., Hopkins, Minnesota, spoke on "Contractor Participation and Benefits", and the President of the St. Louis SAVE organization, Mr. Irwin Shayne, discussed "Subcontractor Participation and Benefits".

Purpose of the seminar was to encourage defense contractors to apply value engineering practices to production of items they are providing for defense, thereby reducing costs to the government.

Secretary Fouch told contractors that the Department of Defense is interested in VE for three reasons: VE generally improves the product; VE fosters greater economy; and VE contractors when offered reward incentives will challenge contract requirements and in turn save DOD money.

Military agencies co-sponsoring the seminar included: the Army Mobility Equipment Command, Army Aviation Materiel Command and the Defense Contract Administration Service Region, St. Louis and the Army Ammunition Procurement and Supply Agency, Joliet, Illinois.

EXECUTIVE SEMINARS IN VE

The first of 12 Defense-sponsored, nationwide Executive Seminars in Value Engineering was held in the Pentagon, 14–16 May. These seminars are designed to provide top level executives (other than VE personnel) in the DoD with a basic understanding of the benefits obtainable from a well executed Value Engineering Program. Each seminar's schedule calls for attendance at a morning (0900–1200) or an afternoon (1300–1600) session on each of three successive days. Attendees include program/project managers, procurement officers, contract division chiefs/directors, as well as technical, audit and logistic support managers.

Additional seminars will be conducted by the Army Management Engineering Training Agency (USAMETA), Rock Island, Illinois, in selected major population areas throughout the United States over the next 11 months. Areas tentatively selected are Dayton, Ohio; St. Louis, Missouri; Los Angeles and San Francisco, California; Chicago, Illinois; New York City, N.Y.; Philadelphia, Pennsylvania; Boston, Massachusetts; and Seattle, Washington. The Military Departments and DSA will host the seminars at specific locations.

Mr. Paul Dobrow, Office of Army Chief of Research and Development, is managing the DoD seminar program. Lecturers are Messrs. Cliff Darby and John Tunwall of AMETA.

(From left to right) ***Messrs. Kempter (OASD I&L), Watne (DSA), Harris (Air Force), Dobrow (Army), Hewitt (Navy) comprised the planning group for Nationwide DOD Executive Seminar in Value Engineering. The group is shown selecting typical value engineering actions for display to seminar attendees.***

Some Tailor-Made Savings—

UNSTITCHES ARMY THREADS

The single thread encircling the salvage end of each leg in a new pair of dress uniform pants prevents raveling—and serves the same purpose as a scalloping by pinking shears. But, then, who cares about a raveled end that will be cut off and thrown away when the trousers' length is shortened to fit the wearer? Right! No one gives a ravel.

That was the conclusion of Mrs. Lillian H. Rabon, a civilian employee at Fort Jackson for the last 14 years. Her idea to omit the leg-end stitching saved the Department of Defense $50,000. True, the stitch cost only a fractional cent per leg (to be precise, $.0118 per pair of pants) but on 4.2 million pair per year that's quite a ball of thread.

Mrs. Rabon was a seamstress in the General Equipment Shop at Fort Jackson when she submitted her idea. She has since been promoted to Inspector. Photo shows her receiving award.

NO JOKE KEEPING TENT IN STITCHES

Because Mario J. Pastore and Ray C. Sheppeard, canvas workers in the General Support Branch, Post Field Maintenance, Fort Riley, Kansas, jointly submitted a suggestion to rivet instead of stitch tie tapes to tents, they will save the Federal Government repair costs of $5,800 at Ft. Riley and thousands more Defense-wide.

The new method eliminates handling the bulk of the tent, that is, it is no longer necessary to dismantle a tent to have the tie tapes stitched on. Repairs can now be handled by one man in approximately 15 minutes per tent opening. Stitching requires two men and approximately 30 minutes per tent opening.

This suggested method was sent by Fort Riley to the U.S. Army Mobility Equipment Command, St. Louis, Missouri, and met with approval. The personnel there estimate that 270 tents at Ft. Riley will need repair up to April 18, 1968 when new tent specifications will go into effect. A savings of $17.50 in repair of each tent multiplied by the number of tents that will require repairs, amounts to a tidy net of $5,800.

Canvas workers Ray C. Sheppeard (left) and Mario J. Pastore (right).

CABLE CALLS CANCELED

The Navy Electronics Supply Office (ESO) manages oodles of tough-to-manage parts for electronic systems and equipments. And cable is one of the toughest because it is so scarce.

Once an item is hard-to-get and stays that way, backorders pile up and reorders start rolling into Inventory Control Points such as ESO. Soon there is enough duplication and complication to knock cable-keepers for a loop. Sometimes it seems the only way out is to cancel *all* the requisitions and start from scratch. Only *that* doesn't work because everybody just turns around and reorders.

To splice the loose ends, ESO's able Cable Task Force Chairman, Clarence Beckman, centralized the backorders within ESO and had the computer programmed to print a bi-weekly listing of cable requisition data.

This and other information enabled Beckman to challenge requisitions on a selective basis.

Results? Hold your breath! Enough unnecessary orders of critical cable were canceled in fiscal year 1968 to permit the Navy to wind up with a $959,439 saving—without shorting anyone in the process.

AWOL'S COST LESS TODAY

A current TV ad that sales-pitches tight airline scheduling shows some Bonnie-and-Clyde types leaving the Keystones grounded as they swing up, up and away.

Now comes Ft. Hamilton (Brooklyn, N.Y.) with a buck-stretching idea for airfreighting AWOL's from county clinks to the Ft. Dix stockade.

The scenario unfolds like this.

ACT ONE. Time: fiscal year 1967. *Setting:* New York State. Fort Hamilton has a responsibility for catching and retrieving AWOL's over a wide geographic area. An AWOL Apprehension Team of three military uses a 44 passenger bus to make a weekly three-day run through upstate New York, stopping at centrally located jails to pick up AWOL's for transportation to the Fort Dix stockade. Each military receives $16.00 per diem. Each AWOL is lodged in a county jail for an average of 3–4 days at a cost of $5.00 per day. The distance covered in each run is 1,000 miles at a cost of 45 cents per bus-mile. Tolls average $20.00 per run. These costs total $44,674.84, for an average cost per AWOL of $59.97.

ACT TWO. Time: Fiscal Year 1968. *Setting: (same)* Enter 1st Lt. Richard M. McClory, MPC, with a new procedure effective 1 July 1967. AWOL's, when apprehended, are sent unescorted by non-stop air flight to New York for pick up by the regular bus run from New York to Fort Dix. The average stay of an AWOL in a county jail is less than two days. The cost per diem, bus-mile and toll expenses are eliminated. For the first two months of operation of the new procedure, the average cost of per AWOL apprehension was only $24.06, down from the fiscal year 67 average of $59.97. Annual savings to the Defense Establishment are estimated at $26,752.95 for fiscal year 1968.

FREQUENCY SHIFT ELIMINATES RADAR SYSTEM

By eliminating requirements for a piece of sophisticated radar equipment, the Air Force Western Test Range (AFWTR) recently had a validated cost reduction of more than $67,000 spread throughout the next three fiscal years. In making the announcement, Brigadier General Clifford J. Kronauer, AFWTR Commander, said that the cost reduction meant an actual hard cash savings to the Range of $22,460 per year.

The radar unit, called VERLORT, is a system for gathering important data for the highly successful Mercury and Gemini manned space flights from Cape Kennedy. The radar was also needed to support a program at Vandenberg which involved the obtaining of infrared radiation data from rocket engine exhaust flames and applying this data to the evaluation of infrared instrumentation designed for surveillance or fire control.

The originator of the suggestion to eliminate the VERLORT, Colonel Reuben B. Moody, Chief of the Test Operations Division, contracted the program management officials of the Vandenberg project and suggested that a change from "S" band to "C" band frequencies would delete the requirement for the VERLORT and permit use of the general purpose radars currently operating in support of other Range support projects.

The program administrators found that the idea is workable. The VERLORT requirement was eliminated from the contract with AFWTR's operations and maintenance contractor, resulting in a savings to the government of approximately $11,230 in decreased manpower requirements.

WILDLIFE MANAGER STILL GAME

Two years ago Ken Brown, Chief of the Land Management, Field and Wildlife Branch, Fort Huachuca, Arizona bagged a $42,500 saving by simplifying the process for issuing hunting and fishing permits.

To show this was no one-shot expedition, this year Ken drew a bead on the procedure for controlling and recording the number of big game hunters in the field. When the smoke cleared, an additional $6,300 had been skinned from costs.

SOWS' EARS AND SUCH

Silk purses transmogrified (*ed.—we had to look it up too*) into sows' ears are being reconverted into silk purses at the Airframe Repair Branch of the Army Transportation School, Ft. Eustis, Va. Damaged aircraft, normally destined for the junk yard, are being sent to the school for use as training aids for students learning to repair the bodies of wrecked aircraft.

This procedure not only spares flyable aircraft from academic wear and tear but it also produces a student-built fuselage that can be used in other training courses.

The Airframe Repair Branch conducts classes day and night with five classes attending school during each time period.

The day students in the advanced class are working on the repair of a CH–54 Flying Crane at the present time, and the night school advanced students are making repairs on a CH–47 Chinook.

According to CWO3 Donovan E. Behmy, one of the instructors in the branch, the complete repair on the Flying Crane will take approximately 90 days and the repairs on the Chinook will take almost 50 days.

The students gain valuable experience working on crash damaged aircraft. In the beginning of their course they are taught the basics in metals and plastics—their construction, composition and the techniques of laying out and manufacturing repair parts. They also learn the fundamentals of riveting, using pneumatic equipment and the rivets designed for each metal.

After these fundamentals are mastered, they pass into the advanced class to work on the actual aircraft.

IAGS USES LATIN AMERICAN PILOTS

In mapping eight million square miles of Latin America, the U.S. Army Inter American Geodetic Survey (IAGS) has found that one of its most valuable tools is its aviation element. When SEA priorities drastically reduced its aviator strength from 53 to 15, IAGS faced the bleak possibility of reverting to such time-consuming means of transportation as mule pack and native cayucos in order to occupy and supply its surveying sites. So IAGS began to explore the possibility of using Latin American pilots to fly U.S. aircraft.

The Director of IAGS requested authority from the U.S. Army Forces Southern Command (USARSO) to utilize host country aviators. The Commander USARSO authorized the use of these pilots wherever IAGS military aircraft were assigned providing that the pilots meet U.S. standards and that an informal working arrangement could be entered into with the respective host government to cover liability in case of accidents.

A training program was set up in the Canal Zone, and aviators from the IAGS projects in Colombia, Guatemala and Venezuela attended. These countries are now successfully using eleven of these aviators. They operate under the supervision of a U.S. Army aviator to ensure that U.S. standards of maintenance and flight safety regulations are followed. Should the shortage of U.S. pilots continue, similar working arrangements will be conducted with other host governments.

The base pay and allowances of the host country aviators are paid by their own governments, although per diems are paid by the U.S. Army in local currency. By using host country pilots as a substitute for U.S. aviators, estimated yearly savings will amount to $215,900.

BY ANY OTHER NAME

A rack is a rack is a rack (to distort some Stein-ful poesy) and a doggone expensive one when bought sole source—according to DSA's Defense Supply Center at Richmond, Virginia.

Four Center procurement and technical personnel (Gwynn A. McNaught, G. E. Bain, William S. Fairhurst and William C. Metzger) found that seven-compartment wooden magazine racks for overseas libraries and dayrooms cost $141 each in one small sole-source purchase. Whereupon the four analysts recruited value engineer B. A. Moses to the task of writing a specification—which he did.

Invitations to Bid then went to 228 manufacturers in the United States. Fifteen bidders responded. Low bid was $74 each. A one-time procurement of 739 racks at this price saved the Center a bundle.

PENNY-PACKING BOXES

The 7th Army Support Command, Europe had a simple idea with a penny-packing punch. Expensive and hard-to-handle wooden packing boxes were replaced by cardboard boxes. The larger cardboard boxes hold four times more than the wooden boxes and require little labor to put together.

Those 7th Army penny-packers are packing $21,600 annually into Army coffers.

SNOW JOB

A 3,000-ton Composite Building at the Greenland Ice Cap Station has a hard time staying above the snow—which raises the ground level an average 3 feet each year.

The strategy called for adding structural steel sections to the building's eight supporting columns. The catch was that the on-hand 30-ton crane could not safely lift and balance the steel sections (weighing 7½ tons each) into position for splicing to the old sections. So the call went out to Thule for a larger crane. Thule had the bigger equipment but it would have been extremely expensive and time consuming to break it down for shipment by ski-mounted C–130 aircraft.

It was then that Equipment Specialist Larry A. Cordell came galloping (skating, sledding, skiing, snowshoeing?) to the rescue. He worked out a way to modify the smaller crane already on site by adding two pennant cables to stabilize the boom. He also adjusted clutch, brakes, and all cables and then demonstrated back-and-load-down methods of operation.

Result: The U.S. Army Corps of Engineers went safely to work lifting steel—and the Army saved $22,830.

A/C STARTER MAINTENANCE TIME REDUCED

A sticky idea—originated at Fort Lewis, Washington, and adopted by the Army Aviation Materiel Command—reduced maintenance time from ten hours to two on Aircraft Starter No. 756–10–C.

As manufactured, the starter had two insulated electrical posts protruding through the housing of its motor portion, with nothing to prevent the posts from twisting and breaking when the casing nuts were tightened.

The idea? Resinbound adhesive around the collar of the insulators and housing to secure the posts. Results: longer service life and reliability of the product, plus $10,340 first-year savings.

Mr. Edmond T. Brock, an L–10 Aircraft Sheet Metal Leader, and his two assistants, Bernard Brunner and William Richardson, were responsible for this modification. The modification is being considered by the manufacturer as a means of preventing parts deterioration and may be included in future purchases of the finished starters.

REVISED TECH DATA PERMITS COMPETITION

Tracy R. Coleman is shown receiving a Department of the Army Certificate of Commendation and a cash award for $805 for an accepted suggestion saving the government more than $1,300,000 annually. Making the presentation is Col. Delbert L. Bristol, Deputy Commander, U.S. Army Aviation Materiel Command (AVCOM) St. Louis.

Coleman, working in Research, Development, and Engineering at AVCOM, and Mr. Geza Cseri, presently with the Army Materiel Command, Washington, D.C., jointly prepared and revised technical statements of work for six special air mobile type items. As a result, AVCOM is now able to procure all of the items on a competitive basis at prices considerably lower than the previous sole-source quotations.

At the time Coleman and Cseri collaborated on the suggestion, Cseri was an AVCOM employee. He also received a check for an equal amount.

(*MANNING, continued from page 28*)

the Staffing Criteria concept. The SMD/DD–710 pilot study had made it now possible for the first time to tell at a glance exactly what duties each man on a particular ship is assigned at each condition of readiness, what watches he stands, what equipment he maintains, etc.

The importance of having such detailed information in such a readily comprehensible format would be difficult to exaggerate, inasmuch as this information provides the basis for all man/machine trade-off decisions. For example:

- If a particular piece of equipment is removed—and its related function eliminated from the ship's mission—it can readily be seen how much less and what skill level manpower would be saved thereby.
- Conversely, if added equipment is installed, it also is evident how much additional manpower is needed to operate and maintain such equipment.
- If not enough manpower is assigned to the ship, it can be determined which specific ship's functions are most likely to be affected.

This latter situation provides a good example of how the Conditional Manning concept comes into play. If not enough manpower is assigned due to fiscal or other restraints to carry out all functions related to the ship's mission under the conditions stipulated, it is apparent that either the average workweek must go up, or that some functions will have to be reduced or eliminated. Under the SMD concept these functions must be prescribed by the CNO and so stated in the ship's Manpower Authorization.

Keys Manpower to Mission

This represents a major change from the previous unrealistic practice whereby reductions in manpower almost never were accompanied by reductions in mission. More often, in fact, as the operating forces could testify, requirements would increase at the same time the work force available to carry out the requirements would be reduced. Now, under SMD, the burden is on the mission assigners and the allowance writers to get in step and provide each ship's Commanding Officer with the personnel necessary to carry out all assigned duties.

But if the SMD is realistic, it also is flexible, and can be used for a variety of purposes by a variety of people:

As indicated, the CNO, the mission planners and the allowance writers can (and must) use it to prescribe functions reduced or deleted in Conditional Manning situations.

Operational commanders can use it to determine which of their ships is best manned to carry out a specific mission.

The ship's Commanding Officer, and each of his department heads and division officers, can use it: to assign their personnel; to plan work and leave schedules, and training programs; and for a multitude of other purposes.

Ship designers can use it to plan the optimum mix and layout of equipment, working spaces, and personnel accommodations. Draft SMD's, in fact, will have to be included in new ship construction proposals.

Personnel planners can use it to program the Navy's future recruitment and training requirements, and to assign personnel when and where most needed.

SMD A Tool—Not a Cure-All

Is SMD a panacea, then, for all of the Navy's problems? No, of course not. It projects a should-be situation into a this-is world, and must be used accordingly. The CNO and the fleet commanders still must deploy their ships, squadrons, and flotillas as required by the missions assigned. Commanding Officers of individual ships still must husband their personnel resources frugally and manage them wisely. And the Navy still must get the job done, no matter what the situation on paper.

But SMD is a giant step in the right direction. It provides the Navy a new and better tool for management of current resources, and can serve as a rational and realistic blueprint for the future. ☐

Rx FOR DRUG BUYS

Contracting annually for certain drugs so that a military organization can place orders for small quantities from time to time on an "as needed" basis instead of contracting for large, firm quatities long in advance of actual use—

- reduces contracting procurement lead time
- permits the Government greater flexibility in the use of its funds (funds obligation is required only at the time the order is placed)

The Defense Personnel Support Center, Philadelphia, Pa.—a field activity of the Defense Supply Agency—saved $278,589 in fiscal year 1968 by buying 14 drug items under annual requirements contracts.

This type of contract differs from a standard contract in that the supplier agrees to provide quantities of an item whenever the Center places an order for it. The normal contract calls for a specific amount with obligation of funds for the total quantity and definite dates of delivery.

The use of requirements contracts to buy medical items was initiated by the Center in 1966 when the changeover of 17 drug items to this method of procurement saved $734,470. Its use on 16 additional items in April and June 1967 brought further savings of $368,599.

In addition to medical items, the Center also procures food, clothing and related items for the Armed Forces world-wide.

GAO REPORTS FY 1967 SAVINGS

> *"The financial savings attributable to our work cannot always be fully measured. However, our records show that collections and other measurable savings identified during fiscal year 1697, which were attributable to the work of the General Accounting Office, amounted to $190.1 million. Of this amount, $23.4 million consisted of collections and $166.7 million represented other measurable savings. Approximately $21 million of the latter amount is recurring in nature and will continue to future years."—Frank H. Weitzel, Acting Comptroller General of the United States.*

The following reprint is from *REPORT TO THE CONGRESS: Compilation of General Accounting Office Findings and Recommendations for Improving Government Operations, Fiscal Year 1967* (B–138162).

DETAILS OF OTHER MEASURABLE SAVINGS

Details of other measurable financial savings including additional revenues attributable to the audit work of the General Accounting Office during the fiscal year 1967, totaling $166,729,000, are listed below. Approximately $21 million of the savings or additional revenues are recurring in nature and will continue in future years. The items listed consist of realized or potential savings in Government operations attributable to action taken or planned on findings developed in our examination of agency and contractor operations. In most instances, the potential benefits are based on estimates and for some items the actual amounts to be realized are contingent upon future actions or events.

Action taken or planned	Estimated savings
Supply Management:	
Savings in operating costs (estimated annual savings, $2,400,000) and reduction in replacement costs (nonrecurring, $30,000,000) resulting from Coast Guard's reduction of its stated requirements for high-endurance vessels	$ 32,400,000
Cancellation of plans to procure equipment in excess of needs (nonrecurring)	16,403,000
Excess ammunition recovered from military assistance program countries to satisfy other United States needs (nonrecurring)	14,884,000
Cancellation of requisitions for unneeded "Hi-Valu" aeronautical parts (nonrecurring)	8,077,000
Redistribution of unneeded aeronautical material on hand overseas to locations at which needed (nonrecurring)	5,273,000
Return of excess spare parts and support equipment from the Korean Air Force to United States control for redistribution or disposal (nonrecurring)	3,000,000
Avoidance of procurement through reinstating excess or obsolete stocks (nonrecurring)	2,196,000
Avoidance of procurement through reduction of requirements and redistribution of inventories (nonrecurring)	2,100,000
Avoidance of procurement through interservice transfer of items urgently required (nonrecurring)	1,900,000
Avoidance of procurement by furnishing Government-owned Items to contractors (nonrecurring)	1,791,000
Avoidance of procurement through discovery of available items (nonrecurring)	1,623,000
Adjustment of prices under existing contracts or proposed amendments (nonrecurring)	1,483,000
Cancellation of plans to procure or repair unneeded electronic equipment (nonrecurring)	984,000
Procurement of less expensive items than planned (nonrecurring)	728,000
Return of excess spare parts and supplies from the Greek Air Force to United States control for redistribution (nonrecurring)	579,000
Savings on recomputation of erroneous profit rate in a contract (nonrecurring)	388,000

Action taken or planned	Estimated savings
Supply Management--Continued:	
Savings from use of excess hardware resulting in cancellation of purchase requisitions by Government contractor--National Aeronautics and Space Administration (nonrecurring)	$ 318,000
Cancellation of outstanding requisitions for spare parts and support equipment not needed to support the military assistance program for the Korean Air Force (nonrecurring)	314,000
Savings through recovery of items previously planned for disposal (nonrecurring)	254,000
Savings realized from transferring material excess to Federal Aviation Administration requirements to Department of Defense (nonrecurring)	253,000
Cancellation of outstanding requisitions for spare parts which were not needed to support the military assistance program for the Turkish Air Force (nonrecurring)	227,000
Avoidance of procurement through reworking of old items (nonrecurring)	183,000
Savings resulting from returning to active inventory certain items prematurely scheduled for disposal--General Services Administration (nonrecurring)	148,000
Savings through use of Government vehicles instead of the contractors' vehicles (nonrecurring)	114,000
Cancellation of outstanding requisitions for spare parts which were not needed to support the military assistance program for the Greek Air Force (nonrecurring)	88,000
Savings resulting from purchasing aviation gasoline through centralized Government procurement sources--Agriculture (estimated annual savings)	86,000
Savings through competitive procurement of certain small office machines --Post Office Department (estimated annual savings)	83,000
Savings through use of old configuration of an item instead of repairing new configuration (nonrecurring)	64,000
Cancellation of unnecessary procurements of mess trays--General Services Administration (nonrecurring)	42,000
Reduction in procurement of supplies and reduced operating costs due to increased utilization of radio program recording tapes (estimated annual savings)	3,000
Other items--various agencies (estimated annual savings, $31,000; nonrecurring, $52,000)	83,000
Payments to Government Employees, Veterans, and Other Individuals:	
Savings resulting from termination of benefit payments to widow beneficiaries who remarried--various agencies (estimated annual savings)	$ 66,000
Reduction in the rate of premium compensation paid to fire protection personnel--Veterans Administration (estimated annual savings)	12,000
Other items--various agencies (estimated annual savings, $3,000; nonrecurring, $4,000)	7,000
Loans, Contributions, and Grants:	
Reduction of grants awarded to institutions of higher education as a result of amending grant agreements to conform with the provisions of approved State plans--Health, Education, and Welfare (nonrecurring)	412,000
Reduction in noncash grant-in-aid credit for a public school--Housing and Urban Development (nonrecurring)	300,000
Reduction of grants as a result of adjustments for ineligible items included in development cost--Health, Education, and Welfare (nonrecurring)	273,000
Reduction in Federal financial participation in the cost of administering federally assisted public assistance programs--Health, Education, and Welfare (nonrecurring)	215,000
Withdrawal of a claim for noncash grant-in-aid credit for an ineligible fire station--Housing and Urban Development (nonrecurring)	100,000
Utilization of computer services which grantee had paid for but had not planned to use--Health, Education, and Walfare (nonrecurring)	38,000
Reduction in Federal participation in the cost of certain land to be used for a Federal-aid highway and a State park--Transportation (nonrecurring)	37,000
Other items--various agencies (nonrecurring)	24,000
Interest Cost:	
Changes in the Internal Revenue Code requiring self-employed individuals to pay estimated self-employment taxes on a quarterly basis rather than on an annual basis thereby making funds available to the Government at an earlier date and with resultant savings in interest cost on Government borrowings--Treasury (estimated annual savings, $5 million to $31 million)	5,000,000
Savings in interest costs resulting from changes in the Internal Revenue Code establishing an interest-free processing period for making refunds to taxpayers who delay filing their return under granted extensions of tima--Treasury (estimated annual savings)	5,000,000
Reduction in interest cost to the Government by deferring United States Treasury borrowings until funds are needed for disbursement--Agriculture (estimated annual savings)	548,000

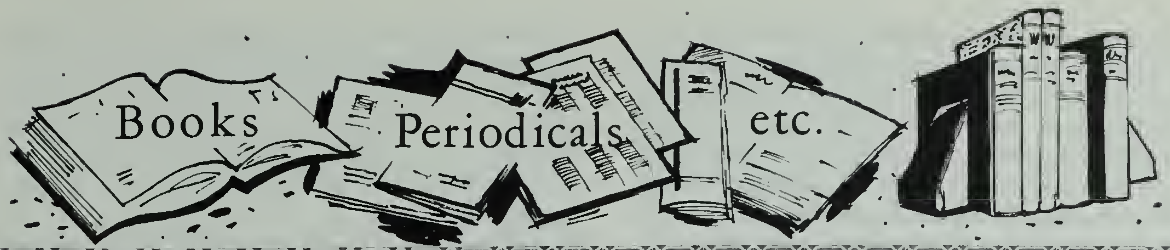
Action taken or planned	Estimated savings
Interest Cost–Continued:	
Savings in interest costs resulting from revised procedures for advancing Government funds to Maritime Administration general agents (estimated annual savings)	$ 239,000
Imputed interest savings to the Government as a result of preventing a 1-year delay in starting the repayment of an interest-free Federal loan--Interior (nonrecurring)	202,000
Interest savings to the Government because of establishment of criteria resulting in disapproval of a small reclamation loan--Interior (estimated annual savings)	121,000
Savings in interest charges realized by liquidating debt--District of Columbia Stadium (nonrecurring)	31,000
Leasing and Rental Costs:	
Savings through purchasing rather than leasing certain office copiers--Atomic Energy Commission (estimated annual savings)	81,000
Savings through utilization of a reduced-rate leasing plan for office copying machines--Commerce (estimated annual savings)	72,000
Savings resulting from terminating contract for unnecessary equipment--Transportation (nonrecurring)	65,000
Savings resulting from other Government agencies terminating more costly leases and utilizing space excess to Federal Aviation Administration needs (estimated annual savings)	36,000
Other items--various agencies (estimated annual savings)	14,000
Rental Income and Fees:	
Establishment of fees for furnishing abstracts of medical records and related services to private individuals and organizations--Health, Education, and Welfare (estimated annual savings)	100,000
Additional revenue due to changes in rental rates and utility charges for Government-owned quarters--various agencies (estimated annual savings)	99,000
Increased revenues to the Government resulting from charging airplane landing and parking fees at a Federal Aviation Administration-operated airport in Alaska (estimated annual savings)	31,000
Other items--various agencies (estimated annual savings)	19.000
Construction, Repair, and Improvement Costs:	
Savings in vessel construction costs by using Coast Guard personnel rather than commercial contractor (nonrecurring)	130,000
Savings in construction costs by using less costly material in certain Coast Guard vessels (nonrecurring)	$ 55,000
Manpower Utilization:	
Reduction of manpower required to administer military assistance program activities in a Far East country (nonrecurring)	700,000
Utilization of U.S.-owned Foreign Currency:	
Dollars rather than U.S.-owned foreign currencies were being used unnecessarily to pay United States administrative expenses in Korea. [The Agency for International Development reached agreement with the Government of Korea to make increased amounts of foreign currency available for this purpose beginning in January 1967. AID officials estimate that a savings of $3,150,000 will be realized in calendar year 1967 and that continuing savings will be realized in future years, depending on the level of United States assistance and country-to-country negotiations.]	3,150,000
Dollars rather than U.S.-owned foreign currencies were being used for annual rental payments to Poland for space at the Poznan International Fair (estimated annual savings)	100,000
Transportation:	
Savings through use of airlift service instead of airmail for overseas military mail (estimated annual savings)	1,128,000
Elimination of overseas transportation by cancellation of orders for unneeded material (nonrecurring)	204,000
Other Items:	
Additional costs to be recovered by the Federal Government from charges that included certain additional depreciation and return on investment for uranium enrichment services (review made at request of chairman, Joint Committee on Atomic Energy) (nonrecurring)	42,000,000
Savings resulting from the termination of a long-term medical research project on aging of aviation personnel--Transportation (nonrecurring)	3,800,000
Increase in price at which electric power and salt water distillation facilities owned by the Virgin Islands Corporation were sold to the Virgin Islands Government (nonrecurring)	2,391,000
Savings by averting the distribution of commodities to ineligible families removed from the rolls in the commodity distribution program--Agriculture (nonrecurring)	665,000

Action taken or planned	Estimated savings
Other Items--Continued:	
Additional proceeds resulting from revision of regulations under the wheat marketing allocation program--Agriculture (estimated annual savings)	$ 650,000
Reduction of labor costs resulting from more realistic wage rate determinations under contracts for construction of certain federally assisted housing projects--Labor (nonrecurring)	563,000
Reduction in costs through improved coordination in geodetic surveying activities within the Federal Government --Interior (estimated annual savings)	420,000
Reduction in construction-differential subsidies resulting from policy change by the Maritime Administration allowing waiver of previously required performance and payment bonds on certain ship construction contracts (estimated annual savings)	316,000
Reduction in operating costs by transfer of general purpose motor vehicle fleet into General Services Administration Interagency Motor Pool System--Interior (estimated annual savings)	233,000
Personnel savings through consolidation of supply activities in Japan (estimated annual savings)	107,000
Savings resulting from the reduction in the number of fire department employees and the consolidation of the fire and guard management staffs--Atomic Energy Commission (estimated annual savings)	106,000
Savings through cancellation of plans to convert to another type of computer (nonrecurring)	$ 91,000
Additional revenue resulting from the inclusion of by-product values in the appraisal of timber offered for sale by the Forest Service (estimated annual savings)	90,000
Savings in transportation costs by increasing the lot-size of shipments of Government-donated print butter and frozen beef to State agencies--Agriculture (nonrecurring)	85,000
Savings through revision of method of computing travel time of reserve officers (estimated annual savings)	71,000
Savings through elimination of unneeded copies of certain preinduction medical reports (estimated annual savings)	64,000
Additional billings for materials furnished under the cooperative logistics programs (nonrecurring)	52,000
Additional revenue from revised log scaling procedures which will more accurately determine and record the volume of national forest timber sold--Agriculture (estimated annual savings)	45,000
Savings attainable by use of Federal Telecommunications System rather than commercial telephone service--National Science Foundation (estimated annual savings)	39,000
Miscellaneous items--various agencies (estimated annual savings, $156,000; nonrecurring, $107,000)	$ 263,000
Total other measurable savings	$166,729,000

COLLECTIONS AND OTHER MEASURABLE SAVINGS

———————000 omitted———————

DEPARTMENTS	Collections	Other measurable savings	Total	AGENCIES			
Army	$ 1,482	$ 10,526	$ 12,008	Atomic Energy Commission	30	42,194	42,224
Navy	2,031	12,471	14,502	Civil Service Commission	2	15	17
Air Force	751	20,684	21,435	District of Columbia Government	1	31	32
Defense	1,237	21,559	22,796	General Services Administration	-	212	212
Agriculture	38	2,263	2,301	National Aeronautics and Space Administration	10	318	328
Army Corps of Engineers (civil functions)	-	10	10	National Science Foundation	1	39	40
Commerce	7	638	645	Panama Canal Company	113	27	140
Health, Education, and Welfare	722	1,132	1,854	Railroad Retirement Board	39	-	39
Housing and Urban Development	-	411	411	Veterans Administration	85	36	121
Interior	15	3,370	3,385	Legislative and other	2	25	27
Justice	1	-	1	Total for audit of departments and agencies	6,828	166,729	173,557
Labor	-	563	563	Transportation audit	12,963	-	12,963
Post Office	1	83	84	General claims work	3,627	-	3,627
State (including AID, Peace Corps, and USIA)	21	3,253	3,274	Total	$23,418	$166,729	$190,147
Transportation	230	36,850	37,080				
Treasury	9	10,019	10,028				



These reviews were excerpted from "The Friday Review of Defense Literature"—a USAF publication whose editors are: Harry M. Zubkoff (managing); Patricia Brown (periodicals); Eva Brecher (books).

● Downs, Anthony, Inside Bureaucracy, Boston: Little, Brown and Company, 1967, $6.50, 292 pp., reviewed by Eva Brecher, SAFAAR.

Little attempt has been made to analyze bureaucratic decisionmaking.

A government bureau is a hierarchal structure of authority and formal communications, supplemented by informal networks, permit control and coordination of activities. An extensive system of formal rules insures consistent behavior by individuals within the bureau and leads to impersonal operations.

However, the officials who influence overall policy are personally involved with and loyal to the bureau. They may be divided into five groups: the climbers and conservers, motivated primarily by self-interest; the zealots; the advocates; and finally, the statesmen. The last three groups are motivated by a combination of self-interest and altruism.

Policy officials exercise control over bureau activities by formal orders and by the use of monitoring agencies or staff personnel. Complete control by policy personnel is impossible since they must delegate authority and allow some discretion to their subordinates. Subordinates exercise this discretion according to their own view of the agency's goals and their personal goals. As a result, bureau activity does not necessarily conform completely to the chief's concept of the bureau's aims.

Bureaus develop ideologies which emphasize their accomplishments and efficiency, and deemphasize their costs and failures. Ideology also serves to reinforce consensus within the bureau about its goals. Selective recruitment and indoctrination strengthen this consensus.

● Diebold, John, "Is the Gap Technological?" *Foreign Affairs*, January 1968, pp. 276–91.

The technological gap between Europe and the U.S. is actually a managerial gap, created by European managerial and financial inadequacies, an outmoded educational system, social immobility, and political barriers. For example, the attitude toward risk-taking in Europe is generally negative; competition and the resulting need to innovate are generally deprecated.

In order to reduce the managerial gap, European nations would have to take a number of steps: (1) establish technological, scientific, and managerial objectives, nationally and supranationally; (2) conclude intra-European agreements on compatible corporate, tax, patent, and social service laws to permit business mergers and wider marketing goals; (3) accelerate and expand revisions of the educational system—a fundamental need; and (4) hire U.S. talent for such purposes as management training and specific application of R&D to the production of marketable goods and services.

● Davis, John R. and Randall B. Ripley, "The Bureau of the Budget and Executive Branch Agencies: Notes on Their Interaction," *The Journal of Politics*, November 1967, pp. 749–69.

Interviews with officials in the Bureau of the Budget, three cabinet departments, and two independent agencies show that: (1) The relationship between the Bureau and any given agency is not necessarily hostile. Relations vary considerably between the extremes of complete agreement and total antagonism. (2) The most important internal factors affecting the bargaining process between the Bureau and the operating agencies seem to be access to and control of information. Some agencies want the Bureau to know only what they think it should know; others do not worry about controlling the information the Bureau receives. (3) Resolution of Bureau-agency conflicts occurs at various levels. Only a few conflicts reach the top. (4) Bureau delay and avoidance of decision may be a tactic in settling disputes. Stalling may eliminate the need for a decision, clarify the decision, or cause someone else to make it.

● "The Technological Gap," *The Economist*, March 16, 1968, pp. 71–6.

The "technological gap" between Europe and America is really a management gap. Technological innovation demands receptivity to new ideas and ability to see their possibilities quickly. American managers have this state of mind because they are well educated. Proportionately Europe produces more scientists than the United States. Most of its managers are not scientifically educated, however, and the proportion of Europe's non-science college graduates is only a fraction of America's.

So far the technological gap has hurt only national pride because US-based technology has spread so quickly throughout the world. Almost all of the science-based industries in which the United States predominates have risen in the last decade. As the United States share of world production increases and United States industries overtake the older European science-based industries, the prospect of European economies dominated by and dependent on American technology will be a matter for real concern.

The USSR is also worried about the technological gap and has come to a similar conclusion: the gap is managerial. The Soviets have a special difficulty. Innovation involves risk, and in the Soviet economy, it is difficult to induce management to take risks. Consequently, the Russians have taken a leaf from the capitalist book and are beginning to use bonuses and other profit incentives to stimulate managerial initiative.

● Hall, G. R. and R. E. Johnson, *Aircraft Co-production and Procurement Strategy*, USAF RAND Project (R–450–PR), May 1967, 234 pp.

An analysis of four United States aircraft produced by Japanese firms between 1959 and 1964 proves that such co-production has several advantages. It is more acceptable to foreign countries than direct sales; local weapons production encourages economic development. Japan, for example, was able to develop its aircraft industry as a result of the co-production program. The United States also benefited by the favorable impact of this program on the balance of payments.

The co-production experience also indicates that various stages of weapon systems production can be contracted for separately. Normally, a single contractor is responsible for all major phases of production. As a result, the Government must depend on the original supplier for follow-on programs, at a price determined by exhaustive cost estimating and analysis. This procedure makes it difficult to arrive at the lowest price, and entails expensive controls over the contractor. It was argued that the cost of transferring the necessary technology to separate contractors would be even more expensive, but the experience with Japan showed otherwise. Furthermore, the competition among separate contractors also works to lower the price.

The Government could obtain similar results by second-sourcing (using two suppliers) or by total package procurement. Second-sourcing involves the added expense of two complete sets of tooling. Moreover, two companies competing for quantity production may be reluctant to transfer information and technology. However, second-sourcing does insure two production lines and may be preferred when large production quantities are required. The total package pocurement technique, on the other hand, is limited. The characteristics of the weapon system must be clearly specified in advance in order to permit intelligent bidding, and the probable total quantity required must be known in order to evaluate the bids. If these factors cannot be resolved in advance at a reasonable cost, separate contracting is preferred.

(This review is adapted from RAND's summary of the report.)

● Richman, Barry M., Management Development and Education in the Soviet Union, East Lansing: Institute for International Business and Economic Development Studies, Michigan State University, 1967, $7.50, 308 pp., reviewed by Charles A. Myers, *The Annals of the American Academy*, January 1968.

Training in management and economics has lagged in the USSR, but interest in both is increasing as new economic incentives are applied to Soviet industries. The nature of the management job, both at the central planning and the enterprise levels, is changing; the manager's educational requirements must be changed accordingly. The author believes that industrial managers have the same basic functions in all societies, but that the similarities are even greater among advanced industrial societies. Much of this analysis is devoted to the differences between Soviet and American management.

Many Soviet industrial managers are engineers because Soviet higher education has produced more engineers than the U.S. Training of economists, on the other hand, has been so slow that Premier Kosygin in 1965 pinpointed the need for economists as one of "paramount importance." What passes for economics in the Soviet Union is generally related to Marxist ideology or consists of applied fields such as accounting, statistics, and merchandising. Soviet managers lack education in general administration, management theory, human relations, the behavioral sciences, and decision-making.

● Kobler, John, "The Flip-Flop Machines," *Saturday Evening Post*, May 4, 1968, pp. 32–6 ff.

National defense decision-makers and planners are increasing their reliance on computers, and Prof. William H. Pickering, head of Cal Tech's Jet Propulsion Laboratory is worried about where it will all lead.

Computers already influence profoundly the conduct of combat operations. The Army has set up the Strategy and Tactics Analysis Group (STAG) to play war games which provide the basis for choosing land warfare strategies. STAG tests alternatives in a variety of situations while considering all conceivable planning factors. Its most versatile model, Tartarus, can juggle more variables than all of history's military geniuses combined could have correlated in a lifetime. In fact, it can play the equivalent of 24 hours of combat in 2 to 6 minutes. Forty-nine other war gaming agencies, including the Air Force's Computer Application Group (CAG), turn out about 1,000 studies a year.

In all, the DoD uses about 2,000 computers, more than half the total Federal equipment, at a capital cost of almost $86 million.

Skeptics contend that gaming is just glorified guesswork, enabling people to arrive much faster at the wrong decisions. Computers cannot reveal the "heart and mind" of the enemy; too many factors in war are unquantifiable, and even illogical. The most sophisticated computer cannot measure the dedication of the Viet Cong, for example. No model could have predicted the effect of Napoleon's bladder infection upon his strategic thinking.

Sir Charles Snow, the British author-scientist, says: "Gadgets are the greatest source of misjudgment. * * * People get fascinated by gadgets. * * * All the bad decisions I have seen have some element of gadgetry in them. And I suspect that computers in government are going to get into the hands of persons with mildly defective or canalized judgment and become gadgets. It will be astonishing if that does not happen."

● Schriever, B. A., Gen, USAF (Ret.), "Systems Analysis: Useful, Yes—But Scarcely a Panacea," *Space Digest*, May 1968.

Operations research brought a scientific approach to bear on the analysis of military problems when it was applied for the first time to the Air Force bomber command in World War II. The techniques of mathematical analysis helped determine which industrial targets were most important to the enemy's war effort, and in what order and at what rate they should be attacked. Today, systems analysis, based on the many post-war advances in mathematics and data processing, is used to make reliable and disciplined comparisons between alternatives. This technique was effective in the ICBM programs of the 1950s, and later in selecting the design of the Minuteman.

Cost-effectiveness studies were introduced in the DoD in 1961, and by 1962 became part of a larger management control system called the Planning-Programming-Budgeting System.

Cost-effectiveness as a means to achieve economy has become increasingly important in recent years. In fact, there is some concern because it almost seems to be the sole standard by which the DoD makes decisions. Even in those instances in which it is the logical standard, it is not always applied properly. In many cases it is applied to only part of the classic management triangle: cost, performance, and time. Weapon systems cannot be chosen on the basis of cost or effectiveness alone. Time is also part of the equation; from a military management standpoint, it is the key factor. Military systems which are not time-effective cannot be cost-effective. Furthermore, the proper control of the time factor in weapons development can produce advantages in both cost and performance.

(*PPBS, continued from page 8*)

increased government investment in human resource programs where the returns appear to be very high, and to a general cutback in total government spending in those programs where higher discount rates indicate that current values of projected investments are negative.

System Shortfalls in DOD

All of the issues I have raised have focused primarily on PPBS as it relates to measuring and evaluating program effectiveness. Yet there are other areas of government management where we have hardly begun to scratch the surface in applying PPBS. While it may have been wise to focus PPBS initially at the areas of major program decision, there exists a huge potential for cost reduction in the application of these techniques to the real "nuts and bolts" of Government management—procurement, property management and inventory control.

In the area of Defense management, for example, there is a good deal of evidence that PPBS has not helped bring about the economies in government that it should have. Congressional investigations of Defense procurement, within the past year or two, have revealed incredible waste and shocking mismanagement. Thus, committees in both the House and the Senate have disclosed deficiencies in the management of small items procurement, the TFX, and the M–16 rifle, to name a few programs.

Last year's hearings of the Subcommittee on Economy in Government into government procurement and property management have exposed even greater deficiencies in procurement, property management and inventory control. The Committee's unanimous report concluded that DoD is guilty of "loose and flagrantly negligent management practices" in its procurement program, that DoD's policy and practices surrounding the furnishing of government-owned property and replacement of such property constituted "perhaps the most serious problem uncovered in recent years of this subcommittee," and that "DoD has failed to establish adequate controls over the inventory of its approximately $15 billion of property furnished to contractors."

All of these problem areas point to the failure, so far, of PPBS to elevate defense analysis to a level where the massive resources allocated to DoD can be expected to be used efficiently. The examples of mismanagement have become so numerous that they can no longer be dismissed as isolated cases or exceptions to the usual practices. Rather, they indicate the presence of systematic defects within DoD. If PPBS can help root out these defects and aid in the elimination of arbitrariness and diseconomies in Defense programs, it needs to demonstrate this capability. □

(*AUDIT, continued from page 30*)

self that all levels of management in his organization are properly motivated by job satisfaction and achievement. It is a well-known fact that junior personnel become interested in subjects of interest to their superiors. Management personnel, however, should avoid a mere delegation of their responsibility in cost reduction down the line or the program will suffer. Each echelon of management must accept its full responsibility in the Program and must establish and maintain, at all subordinate levels, the motivation provided by job satisfaction and achievement.

Non-monetary awards are important because they give a person the feeling of being esteemed in his work environment and among his family and friends. An effort should be made to include the family in any publicity or ceremony in recognition of achievement. The family can exert immeasurable influence upon a person when they know he has an opportunity to originate a significant and personally rewarding cost reduction action. In addition, when a person is successful the recognition he receives at home as an "achiever" spreads throughout his social environment and acts as a strong stimulus toward further successes.

Some of the means for honorary recognition of achievement include letters of commendation, certificates, medals, lapel emblems, notations in personnel records and in performance evaluations. This honorary recognition should include special awards ceremonies and special exhibits giving credit to the originator of the cost reduction idea. It should be borne in mind that the method of presenting such awards is as important as the awards themselves. The recognition of his achievement is an important event in the eyes of not only the awardee but also of his family, colleagues, and supervisors extending to the highest levels. This type of motivation should be used extensively in the Cost Reduction Program.

Money Counts Too

There is no question about the motivating effect of monetary awards in recognizing achievement, which includes incentive awards through the Beneficial Suggestion Program. (Monetary awards are not administered through the Cost Reduction Program. However, their use is authorized under other existing programs.) The judicious use of monetary awards will help to produce the proper climate for successful execution of the Cost Reduction Program. Again, the method of presenting the award should in itself have a motivating effect by making the event not only important to the individual but also to his family, colleagues and all levels of management.

Stepping up Progress Toward Goals

Experience has shown that the Navy's Cost Reduction Program reports for the first quarter of a fiscal year contain much less than one quarter of the annual monetary goal. This under-reporting continues to a lesser degree during the second and third quarters, followed by an avalanche of reports in the fourth quarter. The problem therefore appears not to be one of actually achieving savings, but instead appears to be one of reporting savings which have already been achieved. There is no easy answer or simple solution to this problem. The following, however, are possible ways of alleviating this condition.

Quarterly Goals Ease the Pain

Experience shows that the Navy invariably exceeds its annual goal. Experience also shows that Program Managers become concerned as the end of a fiscal year approaches and only a small percentage of the annual goal has been achieved. Management then resorts to the "hard sell". At this point, the "goal" becomes a "goad". The result is everyone becomes report-conscious and once again the Navy achieves its annual goal. The key factor in this accomplishment is the personal touch. Therefore, we suggest that the personal touch be used by Program Managers throughout the fiscal year instead of only toward the end.

Currently, most of the personal recognition and publication of outstanding achievements are at the end of the fiscal year. It may be that more frequent use of this technique will provide a needed boost to the reporting process. Award ceremonies at other times during the fiscal year would produce comparable benefits in publicity and recognition. This technique can be adopted by individual Navy activities to create a favorable cost-conscious, report-conscious environment. For example, each month, at one activity, the Division Directorates meet and review all employee suggestions, cost reduction reports, and any other worthwhile contribution made by employees, and make appropriate awards. The key rule followed at this activity is that the action does not necessarily have to qualify under Cost Reduction Program criteria. The purpose of this monthly award is to motivate the personnel of the activity. Awards may be letters or just a handshake and a personally extended "well done" by a high official of the organization.

Sloppy Reports Cause Rejections

Reports of savings must be validated by audit before they can be counted as achievements toward the established goal. Reports can be audit validated only if they are prepared in a manner which shows that the action qualifies as a reportable accomplishment under the concepts and guidelines of the Cost Reduction Program.

A significant cause of discouragement to participants in the Program is the rejection by audit of Cost Reduction Program reports because of improper preparation and documentation. Participation in the program can be improved, motivation made more effective, and attainment of goals facilitated by greater attention at all levels of Program management to the proper preparation and documentation of reports.

An individual preparing a report must be familiar with the applicable criteria, and must follow this criteria carefully before submitting a report. This requires an educational process. When changes in criteria are made by the policy makers, these changes must be promulgated immediately. When questions of interpretation or application of criteria arise, they must be answered as soon as possible. Where necessary, the policy makers themselves should be requested to provide assistance.

Experience shows that most problems concerning preparation and documentation of reports can be solved at an intermediate level, sometimes by informal conference. Recently, for example, a specific problem in validating reports arose because of a change or tightening of the criteria. The problem was solved at an informal meeting with the Cost Reduction Coordinator. With his assistance, several reports that would have been rejected as a result of audit review were validated. The problem in this instance was that the individuals submitting the reports had not studied the Cost Reduction Manual thoroughly. This example illustrates the need for Program Managers at all levels to assure themselves that current criteria are understood and used in report preparation.

Questionable reports should be intercepted and corrected, if feasible, at whatever level the deficiencies are discovered. Audit review should not be relied on as the only way to eliminate questionable reports. The Director for Cost Reduction Policy, OASD I&L, in a recent article, stated that the integrity of the program should always be the prime consideration of the cost reduction coordinator, and that it is better to eliminate questionable savings than to include them and detract from the integrity of the Program. In connection with this subject we recommend that every Program Manager read and apply the article, "THE ABC's OF COST REDUCTION MANAGEMENT," contained in the Fall 1966 issue of the DoD Cost Reduction Journal.

Assign Versus Invite

The Chairman, U.S. Civil Service Commission, has stated that *assign* does not convey the factors of motivation, stimulation, and encouragement that are needed if we are to gain the very best cost reduction results from our human resources. Instead, we want to *invite* each employee to search aggressively for operational economics. We want to *challenge* each employee to exert maximum economy in his day-to-day use of supplies, equipment, manpower and other resources. We want to *inspire* each employee to be alert to the dollar and cents aspects of his job and his organization.

We should take another look at our method of establishing goals. Are we really inviting, challenging, and inspiring? If we are merely assigning goals perhaps we can take steps to make goals more acceptable. Goals developed should be reviewed and approved and should be changed if necessary in the light of additional information. Because goals are targets they should serve to establish a rate of progress believed to be possible, and motivate by presenting a challenge.

It is possible that at the grass roots level many managers and other employees are not being reached and are not participating in the Program. The improvement of goals and the integration of cost reduction into existing management systems of the activity would aid in reaching all employees. Also, available motivational aids, such as recognition of outstanding contributors training and general publicity can be used more extensively.

Past practice of allotting the goal for an entire cost reduction area to the organization most closely related to the area should be reconsidered. A manager concerned primarily with one or two cost reduction areas should be required to be familiar with the concepts and guidelines of all Program areas, and should be alert for savings in every area. Where there is no motivation there will be no action. ☐

COST REDUCTION AWARD—For being selected one of Pacific Air Forces First Annual Cost Reduction Award winners, the 315th Air Division recently received a trophy after winning the honors in the "outstanding goal achievement" class for fiscal year (FY) 1967. During FY 1967 Division units turned in validated savings of $979,400—or 213 percent of the established goal. Admiring the trophy is Colonel Charles W. Howe, 315th commander.

LETTERS to the

CLINTON, OKLAHOMA, *April 25, 1968.*

Sir:

My congratulations to Dr. Charles F. Austin for his article "The Loneliest Man in the Military is the Man with a New Idea" in Defense Management Journal, Volume IV, Issue No. 1. I enjoyed it very much—glad to see someone bring out some of the problems the military has trying to put across new ideas.

I never had any problems with my commanders getting ideas through but I do know from others' experiences that my own experience is far from universal. In many cases it's the human reaction from the commander who may think his subordinate is trying to show off or make him look bad. The fact that the subordinate developed the idea, that HE, the commander should have thought of, is sometimes a hard pill to swallow.

The Incentive Awards Committee does a pretty good job, creating top quality publicity and incentives for the military to submit ideas; but I believe it falls short in helping the military with ideas, especially if they don't have the ability to present them properly.

Why is this so? Well, a military comes up with an idea he thinks is good. To the best of his ability, which may not be the best, he fills out DA Form 1045—makes sketches or drawings if necessary—submits it to the Incentive Awards Committee—gets his receipt. He then keeps his fingers crossed for 6 months or more for results. If he is real lucky he may get some cash, a commendation letter signed by a general officer or an engraved cigarette lighter, even if he is a non-smoker.

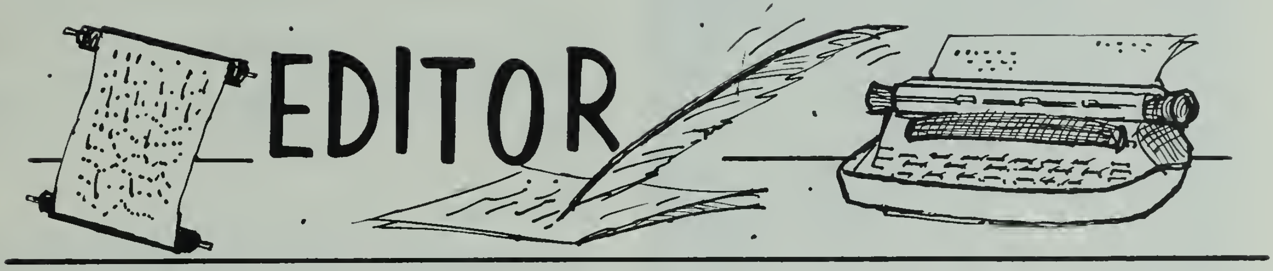
Another shortcoming, as I see it, is that these ideas are reviewed and evaluated by a group of officers and maybe a few senior noncommissioned officers, who are appointed to this duty in addition to their other duties. They meet once in a while to evaluate these ideas and decide which are worthwhile. This committee's interest and ability to evaluate these ideas varies from one installation to another for the type idea being considered.

Looking at the problem from the subordinate point of view, I believe that many military with ideas, especially radically new ones, have other problems besides the one of going through channels. Some of these problems are:

1. The inability to express the idea in writing.
2. The inability to make comprehensive sketches and/or drawings.
3. The fear of being laughed at, ridiculed or criticized by others.
4. The knowledge-restriction which impairs development of the idea by calling for knowledge in some other field.
5. The lack of salesmanship in selling or promoting the idea.

A solution for most of these problems is the creation of a club. It could be called the "Think-In Club." Its purpose should be to help the military with ideas. The local Cost Reduction monitor or Incentive Awards Committee could sponsor it on a full time basis. Military personnel from all services could join this club. Each installation could have a club branch. Here are some of the things the club could accomplish:

1. Serve as an outlet for the military to present their ideas without going through channels, verbally or in writing.
2. Furnish assistance in filling DA Form 1045 or any other writing needed.
3. Furnish assistance in making sketches or drawings, if needed.
4. Help develop, improve and evaluate ideas before submitting them to the Incentive Awards Committee.
5. Serve as a salesman, representative or defense attorney for the military when the idea is being considered by the Awards Committee.



6. Secure tangible proof from reliable sources that it is a valid idea. (For this purpose the club could secure help from military and/or civilian research and development agencies so that the idea would receive a truly impartial evaluation.)

7. Give a periodic progress report to the military of how his idea is coming along.

8. Club members, knowing their ideas will receive the right backing, would then have the incentive to help others.

9. The club could operate as a hobby shop with members getting together on their own time to develop these ideas.

Once this club is organized, there are many other possibilities for it. The main thing is that if an idea does not get through, the military at least has the satisfaction that he received the help he needed and his idea received the proper care.

For a number of years I have participated as a hobby in the Incentive Awards program. I agree with Dr. Austin, we can and should improve the program.

Jose R. Carmona, Jr.
MSG (E–8)
P.O. Box 675
Clinton, Oklahoma 73601

Loring Air Force Base, *23 April 1968.*

Sir:

I read Doctor Austin's article "The Loneliest Man" in the Defense Management Journal and was glad to see that his type of thinking is at that level. His comments hit the nail right on the head.

One other problem I'd like to mention is the requirement of higher echelons and their insistence on letter perfect formats. The mechanic or truck driver doesn't know how to properly fill out AF Form 1000s or DD Form 1603. This is a big stumbling block at this level as the auditors require technical formalities that even most monitors know nothing about. This is a direct result of suggestions being an additional duty. We get these "priority programs" but no "priority assistance".

An example is one suggestion which resulted in three actions and required three days to document. However, it represented a $20,000 savings. Had it been left to a catch as catch can operation I doubt if the savings would have materialized.

I have found that omitting the "middle man" (supervisor) has had a positive effect. If a man merely has an idea he just tells me what it is and I process the paperwork. He signs the suggestion and I take care of the crossing the t's and dotting the i's. As a result we have achieved 175% of our goal in the first three and one-half months of the year.

It is not just a lack of communication, it is a lack of *ability* to communicate and lack of *opportunity* to communicate.

To the man on the line a suggestion is, quote, "some nebulous goal, someone, somewhere, somehow is trying to achieve".

In order to "get ideas that haven't been written" the top level managers must provide the tools to get out and get these ideas. My recommendation is a full time section devoted to just that.

Let a few experts take care of the details of form filling and channels. The important thing is get the ideas. If, out of 10 ideas you get one good idea then the extra effort is well worth it.

Sincerely yours,

Bedford O. Kaddy, Jr.,
Captain, USAF
42d Combat Support Group
Suggestion Monitor
Loring Air Force Base, Maine 04750

(*COMMENTARY, continued from page 3*)

Maconomy

Project Maconomy is General Westmoreland's indigenous Southeast Asian version of the Defense Cost Reduction Program. Last Winter's issue of the Defense Management Journal (p. 56) covered its inception. Now comes the first quarterly report in which General Westmoreland details $241 million in savings and, in addition, shows that 3430 manpower spaces have been realigned for more efficient utilization. Typical cost reduction actions reported include:

- A decrease from $10.90 to $1.21 per unit in the cost of cleaning and repairing sleeping bags, achieved by sharpening the general specification, having each task order show the specific repairs required on a bag-by-bag basis, and enlarging the competitive arena by soliciting bids from mechanical laundries
- A savings of $4 million in fuel drums and bags, achieved by having the U.S. Army Support Command develop a repair procedure for holes and tears in the rubber carcasses of items previously declared unserviceable

General Westmoreland states: "The concept of Maconomy will continue to be stressed as we strive to fulfill our mission."

Cost Reduction Panel

A panel discussion of the Department of Defense Cost Reduction Program was taped for TV on 10 June by the Armed Forces Information Agency as part of its "Pentagon Forum" series.

"Pentagon Forum" is a relatively new series of videotape programs produced by the Office of Information for the Armed Forces for use by stations of the Armed Forces Radio and Television Service overseas. The productions run 29 minutes each, using modern broadcast media techniques to communicate information in a relaxed, informal, question-and-answer format.

The panelists for the Cost Reduction forum were:

- Harrell Altizer, Director for Cost Reduction and Management Improvement Policy, Office of the Secretary of Defense (Installations and Logistics)
- Nancy Massar, Suggestion and Incentive Awards Programs in the Office of the Army Chief of Staff
- CMSgt. Billie F. Harmon, Command Cost Reduction Office, U.S. Air Force Training Command, Randolph Air Force Base, Texas

Four Public Information Officers (one from each military service) asked the questions. The program was arranged and moderated by John C. Broger, Director of the Armed Forces Information Office.

Those who believe that in-house publicity only treats cream-puff topics will be interested in some of the questions addressed to the panelists:

- Is the program worth the paperwork?
- Are civilians more alert to cost reduction opportunities than are military personnel?
- Doesn't the pressure of goals cause organizations to cut so deeply that it hurts their combat readiness?
- Why don't companies that are not Defense-related have cost reduction programs?
- If the savings are real, why is the Defense budget so large?
- Isn't the audit of cost reduction savings only a rubber stamp action?

The video tape will be available in September at all Armed Forces Radio and TV network Distribution Centers.

Motivation

Recent studies by behavioral scientists at Western Reserve University and the University of Michigan indicate that money is a less effective motivator than either conscience (i.e. pride of workmanship, dedication to the job, self respect) or desire for esteem. These behavioralists feel that inculcating feelings of responsibility and accomplishment is the best way to motivate personnel. In the human sphere, solutions are never all one way or the other and, of course, the money-reward cult does have its top-level supporters—like the personnel executive who said of money: "Just take it away and see what happens." □

(*COMPETITION, continued from page 12*)

Last year we held 30 conferences throughout the U.S. attended by over 10,000 businessmen. The major purpose of these conferences was to interest new sources in bidding on our procurements either as prime or subcontractors. Over 600 new suppliers were obtained through this technique. And, of course, we encourage our prime contractors to utilize competition in their procurement programs since about half of the prime contract dollar is spent on subcontracts.

In Conclusion

Defense procurement is the largest single item of the Federal budget. It involves 15 million purchase actions each year, some 65,000 Defense personnel, and 24,000 different companies which employ over 3 million workers devoted to Defense work. Fairness, integrity, quality, and economy are the watchwords of those who manage this vast and complex process.

We do a great disservice to our personnel, to industry, and to the public understanding, when we allow unwarranted charges of inefficiency, favoritism, collusion and fraud to go unanswered.

While there will always be human error, it is my deep personal conviction that there is no more prudent and skillful management job being done in any segment of our economy than that which is done by Defense managers and Defense contractors. □

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MISS COST REDUCTION 1968

Good looks promote good causes at the Naval Air Rework Facility, North Island (Calif.) where the photo shows Claudia Thornton, as Miss Cost Reduction 1968, receiving an $8 million check from NARF's Commanding Officer, Captain William H. Shockey. The $8 million check symbolizes the cost savings attributable to a modification of F–4 fighter aircraft.

PANELIST MAKES POINT

Cost Reduction panelist Nancy Massar (see story opposite page) emphasizes the need for prompt decisions on cost-saving ideas in order to maintain vitality in suggestion systems.

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FLARE